Telephony.

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H. D FARGO, President and Treasurer
S. R. EDWARDS, Editor and Secretary

H. D. FARGO Jr., Vice-President and Advertising Manager
D. C. SORENSEN, Western Advertising Manager

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"ONE FOR ALL AND ALL FOR ONE" A GOOD RULE TO FOLLOW

The value of co-operation among telephone companies has often been urged in these columns. In fact, it may be an old story to TELEPHONY readers, but the importance of united, harmonious action on the part of telephone owners—especially towards the public—is so vitally necessary to the success of the whole industry that it needs constant emphasis.

Companies operating in contiguous territory are injuring themselves as well as their neighbors if they do not agree on similar policies in dealing with the public, so that telephone users in one county, for instance, receive the same treatment accorded those in an adjoining county.

The company that makes concessions to its patrons just for the sake of "putting it over" on a neighboring company is shortsighted. The rule should be "One for all and all for one," with due respect, of course, for the public's rights. And they, be it remembered, are usually well protected.

* * * *

Under the headline "Inter-dependence of Telephone Systems," the monthly bulletin of the Texas Independent Telephone Association discusses this question of company cooperation, and makes some good points that are worth the consideration of all telephone men. Lack of harmony in the operation of neighboring telephone companies and lack of operating facilities, the association says, are two conditions which will injure telephone success and telephone good will.

The Texas bulletin then continues:

"If there is lack of harmony between neighboring systems in operating methods, or in charges for service, there will never be that public satisfaction which augurs for good will customers. If one system charges service connection and moving fees, as every telephone management should, patrons will feel that it is an imposition that they must pay while their neighbors in a neighboring system do not.

If the management of one system carefully and accurately checks overtime on long distance service, and the neighboring system does not, or if subscribers in one system are held to an established time limit in holding local lines and those in the neighboring system are not, the information sifts from one system to the other and the company which holds to the rules and regulations which correctly protect the use of lines for all alike, will be unjustly censured by the thoughtless public.

So it is in the matter of collections, of restricting non-subscribers' use of the service between exchanges, which latter is a nuisance and a money loser to all who hold to it as a business policy.

Indeed, none of us can afford to indulge in unbusiness-like privileges to the public or exactions from our subscribers which are injurious to the telephone business and telephone good will generally. The right way of interdependence helpfulness is the customary way of successfully conducted systems; and the telephone management which pulls away from its neighbors, in order to curry temporary favor, or cause embarrassment to a neighboring company, is not helping itself.

It is back-biting and halting the progressive methods that lead to telephone business success, and that help telephony to uniform methods—the only means of convincing telephone patrons, as a whole, that we are agreed on what is best for the public and for ourselves."

* * * *

In closing, the bulletin offers this advice which is chockfull of good sense:

"It would be a great help to our business, and to public satisfaction and contentment, if we would do more teamwork and less distrusting, opposing and self-aggrandizing in our neighborhood relations.

We depend very much on our neighbors for helping our service, and should not practice any shortcomings that will cripple the success of neighboring companies that are ambitious to succeed, and thereby to help us, if we will but fall in and keep step with system."

* * * *

In the course of the year many company managers write this office to inquire what constitutes good telephone advertising. Different localities may call for individually different handling, but on the general subject of telephone advertising a good idea of what is most effective may be obtained from a recent article which is going the rounds of the newspaper press. It said:

"The world marvels at the growth of the American telephone system. Nothing has done more to put telephones in practically every American home, than advertising.

Government-owned telephone systems in Europe see no incentive for officials to maintain a growing telephone business and

pay dividends to hundreds of thousands of stockholders.

To show why the American system grows, it is only necessary to read some of the advertising of local telephone companies. A good illustration is advertising appearing in Maryland newspapers during a recent month.

* * * *

"One advertisement appealed to the young person at school to ring up the folks at home and keep up the personal contact. Another pointed out the cheer that is brought to parents when their young people, who have gone out in different walks of life, make a little phone visit instead of merely trusting to an occasional letter. Yet another suggested that a young person away from home, when confronted by problems, get comfort and help by ringing up the home for advise.

All the advertising had the human touch and appealed to every member of every family. The American telephone system grows and gives the best and cheapest service in the world, largely as the result of continuous and intelligent advertising."

After all, it is the "human touch" which gets results in everything—including the supplying of telephone service or driving an idea home by effective advertising phraseology.

* * * *

Very often an outsider gets a clearer view of our business problems than we do ourselves, and reaches the solution more readily. Sometimes it is because he has more expert knowledge and wider experience than we, but frequently it is because we are too close to the proposition to pass judgment as well as the onlooker.

Secretary Ernest Irwin, of the California Independent Telephone Association, in his August bulletin, touches on this subject in urging telephone companies to get the advice and assistance of the association in handling knotty problems. He quotes an editorial from Management which says:

"Looking over a man's shoulder when he's playing cards or checkers may not be the best of etiquette, but it usually gives the onlooker a very clear view of the possibilities of the game. Often he can see the right play while the player is trying to decide.

It is this clear vision of the onlooker that makes it profitable to call in the industrial engineer, public accountant, or income tax expert to straighten things out for you. The outsider approaches the problem entirely unprejudiced by precedent or personal feelings, and applies to its solution the skill and experience gained in handling many similar problems."

Secretary Irwin points out that this applies to all conditions in business life. "We are frequently called in to aid in the solution of a problem which seems to be difficult," he says, "but which may have been solved by some other telephone company, and the solution may be readily applicable to the new situation. The more often you consult with your association when a new situation arises, the more help we will be able to give you."

Moreover, advice and assistance should be sought at once, and before "home treatment" is tried in a hit-or-miss fashion. Very often when the expert is called in late in the case, he finds that the "home treatment" had been a hindrance rather than a help, and that the cure is more difficult than it otherwise would have been.

Development of Telephone in Japan

Survey of Development of Telephone Communication in Japan—Toll System to Be One of World's Most Remarkable—Automatic Systems For Larger Cities—Statistics of Present Development—Home Manufacturers Busy

By Y. Yonezawa,

Chief Engineer of the Telephone Section, Imperial Department of Communications of Japan

The advent of the telephone to Japan is very old; it was in November, 1877, or in the year following that of Graham Bell's invention of it, that a telephone set was first imported to Japan.

Upon the heels of its advent, studies were made on the manufacture of the set as well as in its trial for the suburban communication. In 1889, it was operated over a 123-kilometer distance between Tokyo and Atami; and in 1890, the first telephone exchanges were opened in the two cities, Tokyo and Yokohama.

There were only 179 subscribers in Tokyo and 45 in Yokohama, which, curious to relate, were obtained after assiduous canvassing, the telephone utility being yet very little known at that time. When we think of the ever-increasing number of applications that pour in during every period of application from new applicants, we cannot help feeling the times have realy changed.

With the social developments, the telephone business achieved a remarkable growth and, after several extensions, it has reached the present stage of our occupying the sixth in the number of subscribers, and the third in the number of calls, in the world. The accompanying table shows some statistics of the telephone service in Japan at the end of March, 1926, Korea, Formosa, Sagaline, and Manchuria being excluded.

	March 31, 1926
Number of exchanges	2,119
Number of telephones	636,736
(1) On exchange	561,599
(2) On governmental and private service	75,137
	Kilometers
Length of wire	3,007,600
Exchange line	2,642,000
(1) Aerial	885,000
(2) Underground	1,757,000
Toll line	365,600
(1) Aerial	280,500
(2) Underground	85,100
Employes	20,760
No. of calls per year	1,964,253,521
Local	1,877,566,872
Toll	86,686,649
Population	60,521,600

Table No. 1. Statistics of Japan's Telephone Service.

The long distance communication and the adoption of the automatic exchange system, the two highest telephone technics, have also a remarkable record of development in Japan to which the following lines are devoted.

Development of the Toll Cable.

Since the World War there has been a conspicuous growth in every sphere of our economical enterprises, requiring speedy expansion of the toll telephone communication. On the economical and topographical standpoint, the plan of toll telephone cables has been set hand-in-hand with the recent progress of long distance telephone technics.

The first loaded cable in our country was installed between Osaka and Kobe, which was completed in October 1922, covering a distance of 37 kilometers. The system and practice of the A. T. & T. Co. were followed in it. Soon afterwards, the cable was laid between Tokyo and Yokohama, and Osaka and Kyoto. At present a long distance cable of 800 kilometers is

under construction, running across the main land and connecting the main cities, Tokyo, Nagoya, Kyoto, Osaka, Kobe and Okayama.

Upon its completion, the whole system will be one of the remarkable toll cables in the world, as it is intended to reach Kyushu in the south and Hokkaido in the north. The total mileage will be about 1,600 kilometers and will be comparable with the cable between New York and Chicago.

The installation of this cable is already in project, 90 kilometers between Tokyo and Odawara having been early undertaken, although it was unfortunately destroyed by the last great earthquake in September, 1923, and the original plan was subjected to change. The installation of 204 kilometers, the portion between Osaka and Nagoya being first taken in hand, was completed in July, 1924. The portion between Tokyo and Odawara was completely installed in November, 1926.

The sections between Nagoya and Mitauke, and Odawara and Shizuoka are now under installation. The part between Mitsuke and Shizuoka, and Osaka and Kobe will be installed in 1927. And by 1928 the Kobe-Okayama section will be installed to the completion of the whole length. Except for the section within and along the cities where underground cables are inevitable, aerial lines are adopted with the view of saving the cost.

The cable adopted is of 186 pairs quadded type, consisting of 54 pairs of 0.9 m/m and of 132 pairs of 1.3 m/m conductor. It was loaded by the medium heavy loading type, i. e. 176 mh. for the side circuit and 107 mh. for the phantom, of which the phantom loading was recently changed to 63 mh.

Two-wire and four-wire circuits are to be adopted according to the length of the circuits. Repeater stations are provided at seven different places—Yokohama, Odawara, Ejiri, Toyokawa, Kameyama, Osaka and Himeji. The Kameyama and the Odawara stations are equipped with the Western Electric Co.'s system and are already completed.

Out of the cable and other materials used for the line, the cables, the loading coils and the repeaters were at first purchased from the Western Electric Co., Inc., but lately the Japanese manufacturing industry has made a great stride and there are produced many reliable materials. The cables, for instance, are now supplied by the Sumitomo Electric Wire & Cable Works, Ltd., and also by the Furukawa Electrical Industrial Co., Ltd., and the loading coils by the Nippon Electric Co., Ltd., which corporation will start soon to make repeaters.

It is believed that all the materials will be before long supplied by the domestic manufacturers. The laying and splicing of cables, as well as the installation of repeaters, were all undertaken by the Japanese engineers, and the entire job was done by the domestic hands.

As is shown by test charts, the successful results obtained on the Kyoto-Wameyama section compare favorably with the results on the long distance telephone cables in Europe and America.

The crosstalk is 9 to 10 in βl units in general and in the neighborhood of 8 between some phantom circuits. The singing points in their repeaters are, generally speaking, about 25 T. U. or more through the acquired good impedance characteristics.

There are also plans to install toll cables between Tokyo, Utsunomiya and Takasaki, Osaka and Wakayama, as well as Moji and Kurume, the construction of some of which has already been commenced.

Because of the insular position of our country a great deal of submarine cable must also be laid in order to connect the islands; between Aomori and Hakodate, 66 kilometers; between Oita and Matsuyama, 44 kilometers; and between Matsuyama and Kure 35 kilometers. The continuously-loaded submarine cables have been already laid this year and more will be laid within two or three years.

Size of conductor	Maximum conductor resistance ohm/km.		Mutual capacity per mf./km.				Minimum resistance meg./km.	Damping constant at 900/sec.	Unbalance in mmf./152 metres.		
	0.9 m/m.	1.3 m/m.	0.9 m/m. Side.	0.9 m/m. Phan.	1.3 m/m. Side.	1.3 m/m. Phan.			P-S	S-S	P-P
Max..	26.4	13.2	0.0426	0.0668	0.0432	0.0680			275	102	165
Avg...			0.0375	0.0391	0.0391	0.0623	4,065	6.73	21.5	13.2	20.1

Table No. II—Electrical Constants of the Toll Cable Between Tokyo and Okayama.

Adoption of Automatic System.

The adoption of automatic exchange systems is prevailing at present among the countries of the world due to its recent development and it did not escape our attention. In 1921 a Strowger switchboard was installed for the P. B. X. in the Department of Communications, Tokyo. It was going to be followed for trial use by further installations in some towns of about 3,000 subscribers, but this plan was not carried out, on account of the speedy restoration necessitated for the 15 exchanges which were destroyed in the great earthquake of September, 1923.

The common battery system was used for some exchanges in the restoration work, but it was decided that the automatic system should be adopted for Tokyo and Yokohama without losing the opportunity, and 11 exchanges in Tokyo and two exchanges in Yokohama are to be installed with it. Out of the total of 13, 11 exchanges were opened and all the subscribers restored by 1925, and the other ones are expected to be completed by 1927.

It was indeed a big job to complete the installation of so many exchanges in so short a time, to make installers study thoroughly the details of the equipment, to train operators, and to make subscribers understand the new system; and finally to place them in the satisfactory working condition in connection with the existing manual exchanges.

In order to decide the system to be adopted at first, the productive capacity of the respective suppliers was well considered, together with the conditions unique to our country which received our careful attention. After all, the well-tried out "step-by-step" system was chosen. In Tokyo the six-digit type and in Yokohama the five-digit type are installed; and for the connection between the automatic and the manual exchanges, the W. E. Co.'s call indicator is used. All of these switchboards adopted are of the respective supplier's up-to-date standard type, using the rotary line switch, etc. For the subscriber's sets there are attached G. P. O. No. 8 dials in Tokyo and Siemens & Halske Co.'s dials in Yokohama.

In our summer time the humidity reaches sometimes up to 97 per cent, which lowers the insulation that must be kept up in the high voltage automatic switchboard. For this purpose, the adsole was installed in each exchange. The adsole is the air-drying device, heater and cooler combined, and is the invention of the Chemical & Physical Institute of Japan.

Nine exchanges in Tokyo and two in Yokohama are already opened, and one more was opened in Tokyo in July. The adoption of the automatic system has been a great success, showing excellent results with few complaints from subscribers; in a word, our endeavors are fully rewarded.

The successful adoption and the growing use of the automatic system have given stimulus to the mass-production of its equipments and other material. Their costs have been very much lowered and wider utilization of the system is looked for.

In view of the fact that the automatic is at once more economical than the manual operation, it has been decided to adopt the automatic system more broadly in such big cities as Osaka, Nagoya, Kyoto and Kobe and also in their suburbs. In fact, four exchanges in Osaka and in its neighborhood, one exchange in Koke, of S. & H. type, one in Kyoto and two in Nagoya, of A. E. I. type, are going to be equipped, and they are expected to be opened in 1927 and 1928, the switches for these exchanges having been already ordered.

Exchanges.	Present No. of Subscribers.	Capacity.	Opening Date (System).
Tokyo:			
Kyobashi	5,793	10,000	January, 1926 (A. T. M.)
Honjo	4,793	10,000	January, 1926 (A. T. M.)
Shitaya	5,944	10,000	March, 1926 (A. T. M.)
Kanda	3,025	10,000	March, 1926 (A. T. M.)
Kayabacho	2,288	10,000	March, 1926 (A. T. M.)
Kudan	2,698	10,000	February, 1927 (A. E. I.)
Otsuka	2,281	10,000	May, 1927 (A. E. I.)
Marunouchi	3,191	10,000	May, 1927 (A. E. I.)
Nihonbashi	3,079	10,000	May, 1927 (A. E. I.)
Shiba	2,204	10,000	July, 1927 (A. E. I.)
Asakusa	5,740	10,000	Beginning of 1928 (A. E. I.)
Yokohama:			
Honkyoku	5,033	10,000	March, 1926 (S. & H.)
Chojamachi	5,255	10,000	March, 1926 (S. & H.)
Osaka:			
Temma	1,613	10,000	February, 1928 (S. & H.)
Tennoji	1,629	10,000	February, 1928 (S. & H.)
Kobe: Minatokawa	4,230	10,000	February, 1928 (S. & H.)
Kyoto: Shinnaka Kyoku.	5,079	10,000	February, 1928 (A. E. I.)
Nagoya:			
Shin Honkyoku	3,879	9,000	February, 1928 (A. E. I.)
Nakakyoku	1,942	10,000	April, 1928 (A. E. I.)
Sumiyoshi	1,305	3,000	March, 1928 (S. & H.)
Tengachaya	1,960	5,000	March, 1928 (S. & H.)

Table No. III—Automatic Exchanges Constructed and Under Construction.

The number of automatic exchanges which are contemplated to be opened in 1928, 1929 and 1930 and their subscribers are given below. When there are added 21 exchanges with 72,991 subscribers which are already opened or under construction, the total exchanges will be 37 and the subscribers will be 100,278 in total.

Fiscal Year.	Exchanges.	Subscribers.
1928	11	13,846
1929	2	7,177
1930	3	6,264

At the time of adoption of the automatic system, there was no other way except to rely on foreign manufacturers for supply of the switches, etc., but in anticipation of the growth of automatic exchanges the home manufacturers have come to plan the manufacture of them.

The Nippon Electric Co. will start manufacturing W. E. Co.'s type, and the Oki Denki Kaisha the English type of Peel-Conner Works, and still some others contemplate similar manufactures. It will not be long before we can safely depend on the home-manufactured switches as well as for supply of the other equipments.

International T. & T. Buys Company in Southern Brazil.

The International Telephone & Telegraph Corp. announced on August 15 that it had acquired a controlling interest in the Companhia Telephonica Rio Grandense, which handles most of the telephone business in the states of Sao Paulo, Parana and Rio Grande do Sul in the southern part of Brazil, South America.

The corporation recently acquired control of the Montevideo Telephone Co. and the Co-operative Teleforica Nacional of Uruguay, which together operate more than 19,000 telephones, and the Chile Telephone Co., which is the third largest in South America, operating more than 25,000 telephones.

"Consistent with its usual policy," the announcement said, "the International Telephone & Telegraph Corp. will, to the fullest extent possible, fill all positions with the nationals of the various countries."

Control of Company in Northern Michigan Changes Hands.

Control of the Onaway-Alpena Telephone Co., Alpena, Mich., has been obtained by the group of telephone men who are now owners of the Van Buren County Telephone Co., South Haven, and the Dowagiac Telephone Co. The Onaway-Alpena Telephone Co. covers Alpena, Presque Isle, Montmorency and Otsego counties.

Charles S. Davis, president and manager of the company for the past 14 years, who went to Alpena to do work now completed, will return to his old home in Adrian, Mich., whence he came in 1913 at the behest of Lenawee county people who held a majority of the stock of the company, sold them by M. T. Streeter, promoter. John M. Clark was then president of the company. When Mr. Davis took hold, the company was in bad shape financially and physically. Today its physical property is in fair condition and the value of the stock is well above par.

Dr. O. M. Vaughan, of South Haven, Mich., is the new president of the Onaway-Alpena Telephone Co.; A. E. Huntley, of Saginaw, vice-president; A. B. Chase of South Haven, secretary-treasurer. E. M. Platt and Carl R. Henry are the others of the five directors.

Two Nebraska District Conferences Held This Week.

Secretary Kloidy, of the Nebraska Telephone Association, arranged for district conferences to be held this week at Campbell on August 19 and at McCook on August 20. Invitations were sent to all companies in those sections to send representatives, who were guests of the association at lunch. The program covered the various problems of management and finance, with Chief Accountant I. J. Devoe of the state commission as one speaker.

Traffic problems are not taken up at these conferences, as the larger companies afford opportunities at their district traffic conferences to handle the problems of that end. There were no set speeches, but informal, around-the-table talks.

LOOSE ENDS

By Miss Anne Barnes,

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines, Iowa

Henrietta is not an individual person with individual ideas; she is a type. She is employed in restaurants, business offices, stores, telephone offices, everywhere in metropolitan centers. She is manicured, arched, permanented, and poised upon high, slender heels. She is anywhere from fat to thin, tall and short; clothed in the latest, most expensive apparel, or the best imitation of it that her purse will permit. That's Henrietta.

Her idea of people employed in her particular line in less important towns and hamlets is not at all flattering.

When she raises her new arches disparagingly and voices her opinion of small-town organizations, merchants, and their employes, she emphasizes the fact that she is one of the loose ends of big business which has, for the present, been overlooked. She is the smallest and most unimportant unit in her organization.

But even loose ends may be tucked in and so blended into big-business policies, and I am hoping Henrietta's employers will look for any possible loose ends in their organization and tuck them in before they work harm.

There are small-town salesfolk and there are salesfolk in small towns. And there are Henriettas in metropolitan centers.

Moral: The size of a town and the size of a business endeavor impress favorably, of course, but they are not the measuring stick of the man-power.

What's in Voice of Telephone Girl?

Operator the Company's Most Direct Representative — Qualities Which Enter Into Her Voice — Modulation, Emphasis, Accent, Inflection, Etc., Paper Read at Traffic Conference During the Ohio Association's Convention

By Miss Ada Hootman,

Chief Operator, Cambridge Home Telephone Co., Cambridge, Ohio

The telephone company's business is to satisfy the public's demand for both long distance and local service, and it maintains an extensive and costly plant embodying all means known to render the giving of service possible and easy.

How much depends upon the individual employe in properly representing the company to the public! No matter how sincere or efficient the head of the company may be, yet it may be improperly represented if the same spirit and efficiency is not carried out by each employe.

Upon the traffic department is placed the responsibility of operating with such care and judgment as to secure from it the greatest efficiency and give the company's patrons the very best service possible—the first essential for proper relations between the company and the public.

The mere observance of rules without the spirit will never bring desired results. However, keeping in mind constantly the requirements of good service and enthusiasm in our hearts certainly will help us reach the goal.

It is much harder for the telephone operator to please and satisfy the public than it is for the salesman or saleslady. When serving the public face to face, they can see our desire to serve and the smile on our face, while over the telephone, gestures and facial expressions mean nothing to the public.

Much has been said about the personality of people and there is nothing more admired by everyone than a smiling face, which is a great builder for personality. There are some who are naturally born with pleasing personalities and it is very easy for those persons to adapt themselves to varying conditions and fit in anywhere. However, there are others who seem to be cheated in this particular, or feel that they have been; but with a desire for self-improvement such persons may, by developing a kind disposition and a spirit to serve and help others, accomplish wonders toward building personality.

The successful operator then, being possessed of a personality so necessary in handling the public—how shall she get it across the "highway made of wires" as effectively as does the saleslady across the counter?

"Over the telephone our voice tells the story." The telephone operator represents the company more directly than the employe in any other department. Service is the only product we sell and since we cannot face the public, we are going to have to sell it by showing the public our desire to serve almost exclusively through the medium of the voice. It is through those fine grades of tonal inflection that we reach the heart of the patron and establish ourselves and our company securely in his confidence.

Enhancing Your Self-Investment.

One does not maintain, let alone enhance, the value of his own investment in self by keeping within the narrow circle of his own achievements and never going out to observe the methods, principles and ideals of those who are cooperating and competing with him.—Manager's Magazine.

The human voice is very susceptible to being trained, and the wide-awake chief operator will see to it that this important item is not neglected. In the average office this is done by the chief operator, and in the larger ones by special instructors.

The various elements entering into the ideal operator's voice are many, and form an interesting study for the instructor and student. Among the more important qualities to be studied are: Volume of intensity, modulation, emphasis, accent, clarity of tone, inflection, speaking too fast or too slow, pronunciation and enunciation, any one of which would form a good subject for discussion in such a conference as this.

The operators will find much of interest and profit also in the study of their patrons' voices who, in their varying moods, will reveal their feelings, ranging from anger to deepest anguish or pathos.

Chief operators, or those in charge of employment departments, will find at the time of taking an application that they have a fine opportunity to observe much about the applicant that they really should know before deciding either to accept or reject her. You may learn quite a bit about her thinking ability; you may converse with her and determine to a great extent just what you might regularly expect as to tone of voice, manner and enunciation.

In long distance operating, the recording operator plays almost the most important part in the performance of satisfying the subscriber, she being the one with whom he comes in contact first. She should be quick to sense the viewpoint and attitude of the subscriber, and by kindly given assurance and through a smiling right manner, convince him at the start that he is going to receive prompt and satisfying service.

We never know the great importance of any telephone call; it may mean serious illness, death, or an important business deal. The operator must, however, tactfully limit those who wish to consume too much time in lengthy explanations; and to do this effectively without giving offense depends largely upon the character and accuracy of the voice inflections.

The recorder should be very prompt in taking the details of his call, and be very liberal with that courteous, interested, cheerful and kindly attitude—all conveyed through the tone of the voice—and especially in the dismissing phrase, "Thank you, Mr. ———, we will call you." At this time he most certainly is going to form his lasting impression of the kind of service we are going to give throughout the completion of his call.

The outward line operator should at all times be prompt and courteous in giving reports to the patron, and be sure she is making him feel that his call is receiving personal attention rather than being handled in a machine-like manner.

The man at his desk does not think of us handling calls by the hundred; his call is the only one in which he is interested or cares to know anything about. She should at all times be liberal with her "Thank you," "I am sorry," "Please," "Madam" and "Sir"; and if we are unable to complete his call, or fulfill all his requirements, we should show our regret sympathetically, intelligently and convincingly.

If the subscriber should happen to feel his call is being neglected, here is a golden opportunity for the operator, whether or not she be the one who has been handling his call, to assert herself and again to use effectively that most trusted ally, the cordial smiling voice.

At such a time a cool, unsympathetic voice, showing forth lack of interest or worse, a resentful attitude, will cause a deplorable ending to what otherwise might have been a satisfied call. On the other hand, a careful and concise choice of words, given in a pleasant and smooth-flowing tone of voice, will usually convince the subscriber immediately of his false impressions.

However, we must be careful how we handle such complaints, because there are different types of people; some may require sympathy while others only want prompt business service. We must not overlook the importance of a proper tone of voice and be very careful to sense the complaint quickly and convey the correct impression to the public.

"What's in a Voice?" If one were to answer in a single word she might almost say—everything. It's not the phraseology so much as the tone of voice that reflects the meaning. Have you not heard people sadly misquoted by the exaggerated tone and manner in which a circumstance was related, even though the exact words were repeated. It is infinitely more important then, to guard carefully our approach when wide space intervenes. Over the telephone the smiles which count are those which you put in your voice.

A voice across the telephone can make or mar the day;
Be careful of the tone you use, and think of what you say.
Your pleasant smile cannot be seen, or known your kindly heart,
For people on the telephone are often miles apart.
The girls at other offices have many lines to "mind,"
Mistakes are sure to happen, so be patient and be kind.
For life is like a garden where our daily acts are grown,
And as Nature has ordained it, we will reap as we have sown.
So, sow a smile and reap a smile, and in the end you'll find
That nothing gains more victories than the art of being kind.

How I Determine Force Requirements and Regulate Schedule.

By Grace I. Ryland,

Superintendent of Traffic, The Star Telephone Co., Ashland, Ohio.

Our company employes, especially in the small exchanges, are retained year after year. At a recent annual banquet two new employes were noted from all our various exchanges, which range in size from 100 to 1,000 subscribers.

To determine force requirements in small exchanges, when we only have a monthly peg count, daily observation is necessary. Local conditions in the town and community have a great bearing on the force required. Experience has shown that two exchanges with practically the same number of subscribers vary much as to number of calls answered in an hour or day. Therefore, these exchanges, though similar in size, have different requirements, and must have different schedules.

This also applies to different rural conditions. An exchange with a well-developed rural section must have a different schedule from an exchange with a less populated rural district and a greater number of town stations.

Constant observation, clear judgment and common sense must be used largely in determining force requirements, as well as every routine pertaining to the small exchanges. In the exchanges where the automatic daily peg count is taken, we can judge pretty accurately and anticipate ahead what our force requirements are going to be.

This phase of the traffic has to be arranged for the future; if not, a traffic chief or supervisor is going to get an awful jolt some time, when she discovers the development of her force, or department, has not kept pace with the development of the company or the city itself. In fact, the traffic department of telephone companies has to keep just a little in advance of all other departments, unless it be the equipment, which, as we know, is necessary for the welfare of the traffic.

As to regulating and arranging schedules, perhaps the majority of you will not agree with the methods we use in arranging and regulating schedules. However, this is a resume of my own personal experience, and, as I mentioned, we make few changes in our office personnel, especially the smaller exchanges.

In the small town the telephone office is about the only place of employment that appeals to a girl of fair education and refinement; and fortunately there are a few left who really prefer small towns and home influence to cities and hall bedrooms. Hence a girl on graduating from high school, who is not inclined to go to college, or more often cannot afford college, comes into the telephone office. She often continues there until married and sometimes afterwards, for our company still gives employment to married girls who have been in our employ before marriage.

Now, should we arrange our schedules using the routine of a great many, which is regulated by seniority? For example, suppose Mary Jones has been employed about four years, yet Jane Smith has been there five, and Sally Brown six, and all this time Mary has to work the late hours, regardless of all the doings in the town hall. Do you think she is going to stay employed at that place, waiting year after year for Sally or Jane to leave so she may move up a shift? She is not! If she does not object, her beau will surely do so.

Therefore, if we alternate, Sally and Jane can have their turns in sleeping some mornings, Mary will have her turn of evenings out, and all are happier. You know that is one of the essential things to be considered.

Then what of the exchange that employs more than three or four operators? It works the same, at least up to an office handling 4,000 subscribers, which we do with nine operators, using eight different shifts, working eight hours a day beginning at 6:30 a. m., ending the day at ten o'clock, handling anywhere from 25,000 to 35,000 calls in this period. Each week, we alternate the shifts, each one being numbered, and the operator can arrange her social diversions accordingly.

True, the senior operator should have some consideration, but this can be given in other ways, and she does appreciate having entire mornings to do as she wishes, and again the afternoons to attend matinees and do shopping. With all this for the alternating, she is quite happy to work evenings, and it is much easier to regulate your schedule to cut your operating force to the lowest number, which, from the operating standpoint, is essential, to say nothing of the financial side of it.

To sum it all up, it's much in the manner of training your operating force.

Schedules on long distance are handled in the same manner—alternating. Thus we are able to have the experienced operators on duty with the less experienced, making for better service at all times.

Operators Caught in Flood Stay On Duty.

Mrs. Lollie Glazier, operator at Melville, La., and her assistant, Christine Clark, showed courage and devotion to duty under unique and trying circumstances when the levee along the Atchafalaya River, on which that town of 1,500 people is situated, broke and allowed the swift waters to flood the town.

When other levee breaks had occurred in the vicinity, threatening the safety of Melville, these operators were busy transmitting warning messages to hasten the movement of refugees.

The break at Melville finally occurred at about five o'clock in the morning and, as soon as they learned of it, these two operators awakened and warned as many people in the town as could be reached by telephone. The waters rose rapidly, but there was time for the inhabitants to reach the levee and railroad embankment in safety, and no lives were lost.

Vail Medal Awarded to Employe at Charleston, S. C.

Clyde G. McDonald, line and station installer at Charleston, S. C., was presented with the Theodore N. Vail bronze medal awarded him by the medal committee of the Southern Bell company, at a brief ceremony held last month, in the lunchroom of the Charleston exchange.

The medal and citation were presented by J. C. Thompson, general traffic manager, of Atlanta, who recalled the circumstances surrounding Mr. McDonald's courageous conduct, and expressed his admiration and congratulations.

This medal is one of the two awarded in the Southern Bell territory for the year 1926, the other going to Samuel F. Bowsher, combination man of the Fayette Home Telephone Co. at Versailles, Ky.

The action for which Mr. McDonald's medal was given showed "initiative, courage and perseverance," as stated in the citation accompanying the award.

The Drafting of Telephone Systems

In Drawings Drafting Symbols and Conventions Take Place of Words—Evolution of Simple Symbols for Telephone Draftsmen as Described in Bell Laboratories Record by W. L. Heard, Member of Laboratories' Technical Staff

Drafting may be compared to a great language with each particular type of engineering work having its own dialect. In this language of drafting, symbols and conventions take the place of words and the greater the extent to which simple conventions replace more complicated sketches, the greater becomes the efficiency of the drafting work.

The extent of the saving made by these methods is well illustrated by comparing Figs. 1 and 2. The first is a drawing of a simple cord circuit made in June, 1889; the second, a present-day drawing of the same circuit. Whether they are compared

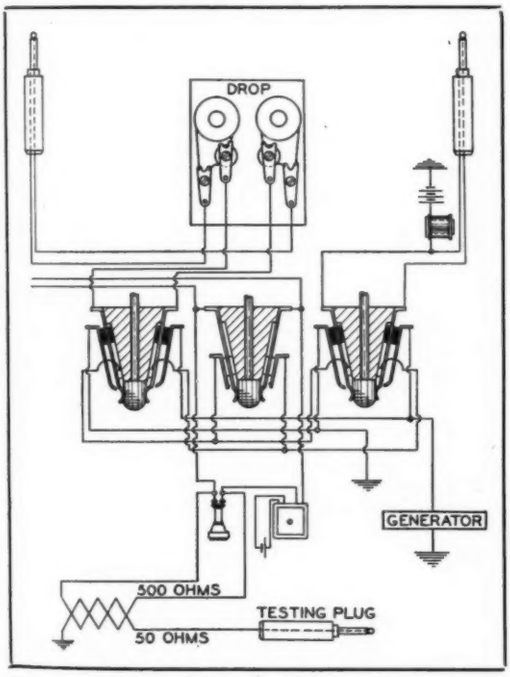

Fig. 1. Cord Circuit Drawing of 1889, Showing Symbols Then Used by Draftsmen.

by the relative space required by the labor involved in drawing, or by the ease of following through and interpreting the circuits by the field engineer, an enormous improvement is evident.

Multiply this advance by the same ratio that the complexities of a large system's drawing bear to the few lines of this simple circuit, and some conception may be obtained of the savings that have been made in time and men, or their common evaluation—money.

This progress, which has been made and is still going on, might be called a development of symbols. It has been the result of a constant search for simpler ways of doing things and for quicker, clearer methods of indicating complex ideas. A relay which to actually draw would require hours and perhaps days, has been stripped to its innermost essentials and then represented by a suggestive symbol. Thousands of such conventions are used, of which a few are shown as Fig. 3.

The large number involved brings up the problem of classifying, arranging, and indexing them so they will be instantly available for the engineer working on design and the draftsman putting the design into standard form, as well as to the men in the field who have to interpret the drawings. For this purpose, the circuit convention book, made up of letter-sized loose leaves and very carefully and completely indexed, has come into use.

A glance at the symbols of Fig. 3 shows how the convention used indicates the essential function of the piece of equipment and nothing of the less important detail.

Fig. 3*a*, for example, shows a relay with a double winding, suggested by the two looped lines around the narrow rectangle indicating a magnetic core. In operating it breaks contact 3 first and then makes contact 1. In Figs. 3*b* and 3*c* a similar symbology may be followed.

Certain functions, difficult to picture, are indicated by suggestive code letters. Thus *SO* is used to designate a slow operating relay, the simple letter, *D*, stands for differential, while *FR* indicates fast release. Many such shorthand notations are used.

Also a very large number of sub-conventions are incorporated into the major conventions. The black dot shown on Fig. 3*a*, for example, identifies that end of the winding nearest the core; which, with a standard method of winding, serves to indicate definitely the magnetic polarity. A circle is used for a pivoting point, and a zig-zag line stands for a chatterless contact. Fig. 3*d* shows two of the lamp conventions, while 3*e* gives some of the familiar vacuum tube conventions.

Standing back of the circuit convention book, ready at all times to give more complete information regarding any of the equipment shown on the drawing by a simple convention, is a card catalog giving all data regarding every piece of equipment used. Again back of this card catalog, covering the items of more compli-

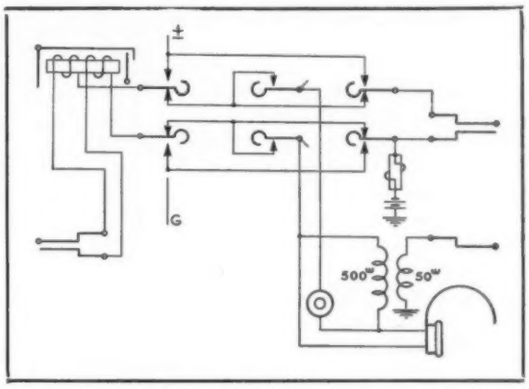

Fig. 2. Present-Day Drawing of Cord Circuit of Fig. 1.

cated detail, are the specification sheets.

All this large mass of information is indexed and cross referenced so that any piece of information is available in the shortest possible time. Duplicate files are available for the engineers and for the draftsmen putting the drawings into final form.

In a similar manner a different class of conventions is embodied in the equipment handbook. The making of equipment drawings involves more or less the same complexity of detail that the circuit drawings do and requires equally the repeated

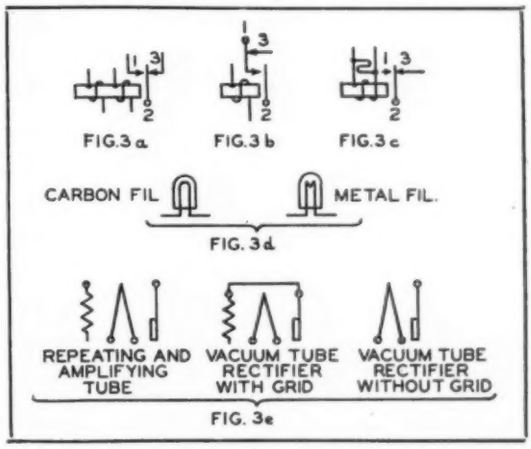

Fig. 3. Some Conventions of Present-Day Drafting.

use of simple conventions and notations.

Each individual construction is detailed on a standard sheet and assigned a code number. On the actual drawings only these code numbers are shown, thus greatly cutting down the labor involved. This is illustrated by Fig. 4 showing a front panel of

a typical switchboard. Each joint, such as *J*-6 or *J*-7, which are glued, deep square tenon joints, has a detailed standard drawing which completely describes its construction. A similar scheme is carried out in the method of indicating welds and in fact to every detail that lends itself at all to this method of treatment.

To meet the varied engineering requirements, many sizes of drawings are needed. Here, also, standardization has been used and at the same time care has been taken not to hamper the drafting work by too strict a limitation.

A unit of length and width of 8 by 13 inches has been selected. All drawings are some multiple of one of these numbers in length and some multiple of the other in width. This insures that any sheet from the smallest, 13 by 16, to the largest, 39 by 64, may be folded up to an 8 by 13 size.

All of these standardizations, circuit conventions, equipment handbooks, etc., are of inestimable value, but after all they do not and cannot serve to make the work mechanical. Back of and vitalizing the whole system, is the intellect of the draftsman which has been trained where and when to use all the means put at his disposal. When it is realized that every year nearly 5,000 new drawings are added to files and 10,000 changes made, the economy from slight improvements in system or technic is evident.

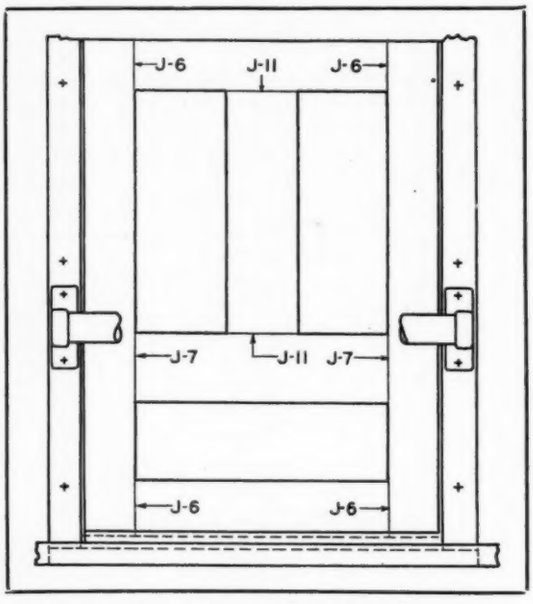

Fig. 4. Drawing of Front Panel of Telephone Switchboard Showing Code Numbers of Detailed Standard Drawings Which Describe Construction.

Illinois Association Selects Springfield as Convention City.

The various committees having in charge the details of the "Service Convention" of the Illinois Telephone Association are beginning their work most enthusiastically. The general committee on arrangements, which consists of Jay G. Mitchell, Springfield, chairman; E. D. Glandon, Pittsfield; H. G. Lankford, Chicago; and George X. Cannon, Freeport, has already definitely selected Springfield as the location for the 1927 convention.

The entertainment committee, consisting of Louis Pitcher, Dixon, chairman; T. C. Ainsworth, Bloomington; and Jay G. Mitchell, Springfield, is beginning a canvass of the field with a view of providing entertainment for the 1927 convention which is equal to the high standard set by the Illinois association in the past.

Both the committee on arrangements and the entertainment committee would appreciate suggestions from members as to features that would be desirable and novel. Address all communications regarding such suggestions either to the chairmen of the committees, or to the office of the association in Springfield, where they will be referred to the chairmen.

All Illinois telephone companies should instruct the employes who are to attend the "Service Convention" of the Illinois Telephone Association to carefully preserve their receipts for registration fee, because these receipts are redeemable at their face value in payment of dues and assessments to the association for the year 1928, the plan being the same as the one which was inaugurated at the 1926 convention.

There is a great degree of enthusiasm apparent in Illinois regarding this year's convention.

Brick Telephone Building Moved With No Service Interruption.

While 3,700 telephone lines into the Jackson exchange, Kansas City, gave uninterrupted service, the two-story brick building housing the exchange at Seventy-first and Main streets was moved south 15 feet. This engineering feat was accomplished after several weeks of preparation to make way for the widening of Seventy-first street.

By means of flexible connections installed for the purpose, not only the telephone lines but the water, gas and sewer service in the building served without interruption. Later the building is to be moved 20 feet east to a permanent location, after similar engineering arrangements are made.

The building was jacked up and placed on huge timbers which rested upon steel rollers. These rollers moved on steel rails so smoothly that occupants of the building scarcely were aware it was being moved.

Some 40 telephone operators calmly intoned their "number, please?" into the transmitters while a great winch, mounted on a truck, slowly and smoothly towed the 650-ton building inch-by-inch to its new location. Subscribers of the exchange were unaware of the change. Their telephones continued to operate as usual.

The feat was accomplished by plans worked out by Harold Vaughn, building engineer, and O. E. Hamelmann, architectural engineer, for the Southwestern Bell Telephone Co.

A temporary structure and hookup of telephone lines to serve the 5,600 subscribers in the Jackson district would have required 18 months to two years to complete and the cost would have been prohibitive, one official said.

Wireless Telephony Between Germany and South America.

Commercial telephone service between Germany and the United States may be established soon, according to a special cable dispatch from Berlin. The international conference of radios to be held in Washington in September will discuss the plans.

An unofficial test of telephone conversation on August 3 between Berlin and Buenos Aires, over a distance of 7,500 miles, was entirely successful, the voices being heard with extreme clarity at both ends.

For half an hour government authorities and newspaper men in Buenos Aires listened to the voices of German officials and newspaper men, which came clearly across the 7,500 miles of space. One speaker in Berlin sent personal greetings to several persons who were listening at the Buenos Aires end. The program closed with the playing of Argentine and German national anthems.

It is stated that the first experiments between Berlin and South America began a year ago and will be continued several months more when it is possible that regular telephonic commercial service with South America will be organized.

Northwestern Bell Establishes New Accounting Organization.

The Northwestern Bell Telephone Co., Omaha, Neb., has reorganized its accounting system by setting up four division centers, all under the direction of R. P. Baird, general auditor, and his staff, which will be composed of W. L. McIntye, assistant general auditor; W. W. Davenport, chief accountant; D. R. Colby, general accountant, and H. A. Livermore, statistician.

Under the new plan, a complete accounting office, handling under one head all phases of accounting work, has been established in each division, and brings under the division auditor all phases of accounting hitherto scattered among various branches or offices. Miller Prentice is

auditor for the Nebraska division; A. Morrill, Minnesota; W. P. Summers, Iowa, and D. G. Palmer, North Dakota.

Mr. Baird believes that the new method will be a big improvement over the old, which had been outgrown both by the increase in business and development of accountancy. The division auditor will be able to supply all information as to investment, revenue expense, personnel, plant measurements and the like, and be in a position to have better use made of this material.

The new system will combine low accounting cost with adequate service and efficient administration. By placing the responsibility for selection and training of personnel on the division auditor, it is believed that it will be possible to supply the demand for more competent telephone accountants.

The assistant general auditor will have general administration of the division offices; the chief accountant will add plant and revenue methods and audit work to his duties, and the general accountant will take over general disbursements and bill auditing. To the division auditor will report the disbursement and revenue accountants and the supervisor of results and general service bureau manager, and these have been refitted into the organization in the most effective way experience suggested.

Personal and Biographical Notes

William J. Carr has been appointed a member of the California Railroad Commission by Governor C. C. Young to fill the unexpired term of the late Harley W. Brundige.

Mr. Carr is a resident of Pasadena, and was engaged in the practice of law in Los Angeles, when named to the commission. He served as a member of the California state senate during the sessions from 1913-1921, inclusive. Prior to that time he was city attorney of Pasadena. He has a wide experience in state and civic affairs.

Patrick Bacon, manager of the Portland, Ore., exchange of the Pacific Telephone & Telegraph Co., was honored with a banquet recently in commemoration of his 40th year with the company. About 50 guests, many of them veteran employes of the company, were present. Among them was J. H. Thatcher, who, as manager 40 years ago, hired Mr. Bacon, then a 15-year-old boy.

O. A. Blackwood, manager of the State Long Distance Telephone Co., Elkhorn, Wis., during the past nine years, has resigned his position and on August 15 went to Fond du Lac, where he became manager of a newly-organized telephone company which operates in 10 different cities. The company already has 5,000 subscribers on the list, and will enlarge the equipment to care for 10,000.

Mr. Blackwood went to Elkhorn in April, 1918, from Racine, where he had held the position of inspector of equipment for the Wisconsin Telephone Co. Since then the State Long Distance company purchased a building and moved its offices and equipment, cabled many of the lines, and increased the subscribers from 700 to 975.

Harry M. Engh on July 1 took up his new duties as manager of the public relations department of the Mutual Telephone Co. of Erie, Pa.

In accepting this position, Mr. Engh began his career as a telephone man. From this it must not be gathered, however, that he is unfamiliar with the business. On the other hand, 15 years of public utility appraising with the American Appraisal Co., nine years of which were spent as manager of the public utility department, have given him a unique and thorough preparation for his new position.

Mr. Engh has made investigations of telephone, electric light, railway, water and gas companies in practically every state in the Union, every province in Canada and the entire West Indies. A conservative estimate reveals the fact that he traveled 50,000 miles annually in covering his cases of reorganization, merger, capitalization, rate and engineering cases.

Harry M. Engh, Former Manager of Public Utility Department, American Appraisal Co., Is Now Manager, Department of Public Relations, Mutual Telephone Co., Erie, Pa.

That Mr. Engh for years has been interested in the telephone game is shown by the fact that for some time he has been a member of both the Western Society of Engineers and the Independent Telephone Pioneers of America.

It was with the heartiest of congratulations and best wishes from his many telephone friends that Mr. Engh joined hands with the Mutual Telephone Co.

Theodore Gary, of Kansas City, Mo., is the subject of an interesting article in the August issue of the American Magazine. The early struggles and disappointments of this well-known telephone man, and his unswerving adherence to the principles of honesty and fair play are vividly set forth. Telephone people will enjoy and profit from reading this story telling how Theodore Gary rose from most humble surroundings to his present position of influence in the telephone world, both national and international.

Chas. C. Deering, Des Moines, Iowa, secretary-treasurer of the United States Independent Telephone Association, is vacationing in Colorado.

Obituary.

George E. Trager, manager and secretary of the Crawford County Telephone Co., of Denison, Iowa, died very suddenly on August 6, following an attack of heart trouble. News of his death came as a great shock to everyone in the community, for he apparently was enjoying the best of health and had been attending his duties at the telephone office on the day before.

Mr. Trager was born at Newton, Jasper county, Iowa, July 29, 1874, and received his education in the public schools of that city. In 1900 he was married to Sarah Mabel Ritchart at Des Moines.

Mr. Trager and family moved to Denison in 1910 to accept the position of manager of the Crawford County Telephone Co. and later he also became secretary of the company, serving in that capacity up until his death. He took great pride in the company and through his efforts and under his supervision the exchange at Denison was improved from time to time until it is now recognized to be one of the best-equipped in that section of the state.

Mr. Trager was held in high esteem and respected by all of the employes of the company who knew him to be a man of sound judgment and fair in his dealings.

Charley Harvey Woodward, age 67, pioneer telephone builder of West Texas, died at his home in Dallas, August 8.

A native of Alabama, Mr. Woodward went to Texas in 1881 and settled at Brownwood, where he later built the first long distance lines between Brady, Goldthwaite, Cisco, Coleman, Brownwood and Ballinger in the 90s.

Selling the system in 1908, he moved to Dallas to live.

Trees and Tree-Trimming Methods

Preservation of Roadside Trees Attracting Country-Wide Attention—Plan of Education Adopted by Ohio Bell Company—Some of Many Factors to Consider—Address at Ohio Independent Telephone Association Convention

By Harry C. Hyatt,
Plant Supervisor, Ohio Bell Telephone Co., Cleveland, Ohio

There is probably no other industry more interested in the preservation and proper utilization of the forest products than the telephone industry, which with the telegraph and power companies, uses each year more than five million trees for their poles alone.

As one phase of conservation, the preservation of our roadside trees is attracting the attention of individuals and organizations throughout the country, and it is appropriate that we wire-using companies keep in step with this increased love for trees and the greater appreciation of them.

In 1923, the Ohio Bell company adopted an entirely new method of doing its tree trimming and removal. Instead of having our linemen do the work, we decided to attempt to have the work done by the property owners themselves, if it were possible, or some neighbor or friend known to the owner, and in whom he had confidence. Besides satisfying the tree owner on the quality of the work, this released our men from a more manual labor job, to the more technical, purely telephone work.

In the eight months following the adoption of this policy, we took care of 71,000 trees that would interfere with proper service on our long distance lines, and 98 per cent of the work was done by individual contractors.

In 1925, by the same policy, we took care of 58,000 trees, 89 per cent of the work being contracted as the year before. However, as increased thought and study were given to this important phase of maintenance, it was seen by the officers of the company that in some way the trees were getting out of bounds. In 1925 they had practically as many interfering trees as in 1924, and in 1926 there were more than in 1925, in spite of a great many decayed, dangerous and hazardous trees that had been removed.

We have just completed a rather accurate census of the trees that will interfere with our toll plant in the next five years and find that we have 127,000.

So it was deemed expedient to have someone in the organization make a study of the problem, plan a program that was reasonable and practical, and attempt to supervise its carrying out. It was thought proper that, for this particular phase of telephony, an outsider—one who knew trees and nothing about telephone work—might be able to look at the problem more as the individual and the public looked at it, and perhaps guide the increased appreciation of trees along proper lines, into expressions that would not interfere with telephone service and would create a more friendly attitude on the part of the public towards the wire-using companies.

We decided definitely on a program of education, not a campaign and hurrah, but just working out where we wanted to get, and then stepping off on the right foot and in the proper direction and keep stepping.

We deemed that we should educate our men as to the modern methods of tree care, their proper dealings with the public and their property, and also educate the public as to why we have to trim trees, what it means to their telephone service, and that we wanted to do the work properly.

We acknowledged openly and to the public that the tree-trimming work of the past was not good tree work, measured by present-day standards.

The standards of yesterday, however, are not the standards of today. The tree-trimming work that was done by wire-using companies 20 years ago was the same type of work that was done on the trees on a man's lawn that he valued highly.

Recently a great deal of development has been done along the lines of tree care—surgery as it is sometimes called. In some states in New England, an examination and licensing by the state is required before a man is allowed to work in another's trees. In this state, a similar bill has been introduced in several of the last legislatures. That shows the trend of public opinion.

Our education of our people consisted of talks, 40 of them so far, some developing into all-day discussions, some of them being evening meetings, to which our employes were invited. In those 40 meetings we presented our subject before over 2,100 people, about 1,200 of them being Ohio Bell employes, the others being other telephone company men, power company employes, state highway and forestry officials, mayors, county commissioners, experiment station officials, directors of public service, fire department people, city planning folks, city foresters; and some, who came, listened and registered just as interested telephone subscribers.

It isn't a technical talk, much of it is known by telephone men, but we wanted to remind them of it, bring the information up on top of the mass of stuff that they have to know—megohms, circuit troubles per mile, transportation, etc—and make it again available so they could use it.

First, it was shown to them exactly what trees do to telephone service, the noise, the crosstalk, false ringing, the unsatisfactory service without completely putting the line out of commission. Then they were shown the money side of tree interference, the loss in revenues when the lines are out of service.

Phantom circuits were explained; how a tree ground can put out two circuits by touching one wire; how messages are carried over the wire in code without interfering with the telephone conversations. Thus one ground on the wire puts an additional service out of commission.

Then we went on to carrier currents, how, by means of different frequencies we are able to carry five conversations over the one pair of wires and by the same principle applied to the telegraph, we have 20 channels over the one pair of wires. A tree ground, in the latter case, means interrupting the conversations of 40 people, or 40 times the revenue that was originally thought of.

So the listeners are in a receptive mood when we get to the tree part of the talk.

A living tree, owing to the liquid sap contained in its roots, trunk, limbs and leaves, is a conductor of electricity. When it is wet from rain or from melting snow it is a better conductor; and, touching the telephone wires, it steals from them a small amount of electrical current.

The normal amount in the wire is so minute that any drain on it, however small, makes a considerable difference in the vol-

Things Which Constitute Success

When we are young—and some of us never get over it—we are apt to think that applause, conspicuousness and fame constitute success. These things don't; they are only the trappings, the trimmings of success.

Success itself is the work, the achievement that evokes these manifestations. Not the prize, but that which enters into the winning of it is what constitutes success. And the man or woman who values the applause more than the effort necessary to elicit it, is not apt to be deafened—at least not for any length of time. Concentrate on your work and the applause will take care of itself.—B. C. Forbes.

ume or the quality of the transmission of speech. That, together with trees that may grow up into our plant, or fall down into our wires, is our whole interfering tree problem.

If everyone in Ohio knew that, knew how important telephones are to their daily lives, whether they had a telephone or not; knew that when we trimmed trees, they would be trimmed as well as the highest-paid so-called tree experts could trim them, then our problem would become a lot simpler than it is at present.

There is no family in Ohio that is not dependent for its happiness, prosperity, and even existence, upon the telephone. In the city, the manufacturer and business men handle their big deals and the small details from their desks by means of the telephone. The housewife does economical buying by taking advantage of market conditions.

The farmers who furnish the food and raw material for the home and manufacturer, and the market for the products of the latter, are equally dependent upon the speed, accuracy, convenience and service of the modern telephone.

Even though a farmer is not a subscriber to a telephone, he is more dependent upon it than if he were. He must get his ideas of neighborhood news from the newspapers; he must get his market quotations on stock and crops that he wishes to sell, from the newspapers; he must keep up-to-date with the news of the outside world, through the newspapers.

The news of the day, as you know, travels over the telephone wires. The stock reports, the orders to buy and sell, the market reports from the various great markets that establish the prices of the farm commodities, the business reports, the crop reports that establish the future farm crop prices, all pass over our wires. Without telephones there would be no market conditions for them to take advantage of, no established market for their goods.

Today, he picks up the paper—and he can tell to the penny what his cattle will bring, what eggs, apples, potatoes, or any other product of the farm are worth. That service was made possible by the telephone—and the telephone again gives him the opportunity to take advantage of the desired market conditions.

We are anxious to give every subscriber *perfect telephone service, but we cannot give it if trees are allowed to grow up into our wires, or blow down into our plant.* A property owner's trees may hold up the message of his neighbor calling the doctor: his neighbor's tree may hold up a message coming to him that has traveled thousands of miles successfully.

The telephone wires have entwisted themselves into the daily life of everyone; the proper and never-failing service has become necessary for the farm, the factory, office and home.

At the same time has come a greater appreciation of trees, and without a doubt this feeling is going to continue to increase. Next year it is going to be harder to remove a tree than this year; and in a short time, perhaps two years at the most, we will have taken out the last of our interfering trees, *because the property owner will not let us take out any more.*

Anyone who plants a tree has some affection or appreciation of the restful shade, the relief from the monotony of the landscape, or the companionship that the tree will give; he wouldn't have planted the tree otherwise. He wouldn't have gone to all the work and expense of getting that tree. He thinks of that tree as maturing, growing up properly and shapely to be a big tree; but it can't grow up properly, it can't be shapely if it is planted underneath our wires.

We originally followed the highways to serve the people living along them, and we will continue to do so, but the time is past when we can jump from one side of the road to the other to dodge an interfering tree. You know better than I that one side of the road now must be left for the power companies.

If you could explain to a property owner the things I have just told you, he certainly thinks little of his trees if he continues to plant them under our wires—or else he isn't made right.

There are cases where it is good business to pay the owner to move back trees that have already been planted.

The Ohio Bell company each year plants many roadside trees—trees to replace others that the property owner, with due regard to your service and my telephone service, allowed us to remove, hazardous trees that we replaced with good suitable trees—planted away from the wires so that they never can interfere.

You can't blame a property owner for refusing to allow you to remove a tree in front of his house. You wouldn't do it if you were in his place; and these trees are the ones we will have to trim periodically. Those people who won't let us remove their trees value them—they are their private property—and if they grant us permission to trim them, we should trim them properly and as correctly as it is possible to trim them, because we have to keep these friends; we have to come back and ask for that permission again and again.

It may seem that outside of the trees around his house and shade for his stock, the farmer is not interested in the other roadside trees. However, you know that conditions are changing.

He is being impressed by his farm journals which keep urging the beautification of the rural highways. Moreover, the rural districts, due to better traveling conditions, which will keep getting better, are gradually being subdivided and inhabited by the former city dweller, who brings with him a greater appreciation of trees and a desire for these things, including trees, which were denied him in the city. Tree conditions are going to be harder to combat, and by doing our work in the best possible manner, we are going to keep up with these changing conditions.

In our talks, we urge upon the men to give special attention to the clearness of trees from drop-wiring. We bring out to them that the insulation on this wire was meant to protect them from each other, and not as an armor against the wearing effect of touching limbs or rubbing branches; and if they are allowed to touch, the wire will be serviceable for only a short time.

We urge that they try every possible means allowable by their specifications to dodge trees; and when they can't, to secure in their trimming, several years' clearance. If the installer is any kind of a salesman, he can surely show the subscribers how necessary it is for their own convenience that their trees be trimmed.

We take up the legal aspects of our trimming problem; that outside of municipalities, the rights of the abutting property owner go to the center of the road. The sections of the Ohio general code having to do with roadside trees are called to their attention.

Many of our municipalities now have the care of the trees between the sidewalk and the curb vested in the city government. Many of the municipalities that do not have any ordinance governing the care of shade trees will, in the future, pass legislation governing them; and we should be interested in making this as liberal as possible from our standpoint. This is one of the developments that we expect to come forth from the program we have started.

We are going to do good tree trimming. We are going to let the public know why we have to do the best possible work. The next logical step is for the public to al-

Factors Influencing Personality.

What you are today is the result of what you did, what you said, what you thought yesterday—I mean all of the yesterdays—and what you will be tomorrow is the result of what you are thinking, and what you are saying, and what you are doing today.

Consequently, don't worry about the past, don't fret about the future, but live in the present and make the most of it.

In addition to these three factors, personality is also governed and influenced by our environment, by heredity and by will power. But environment can be controlled, heredity or the traits of heredity can easily be overcome, and will power can be developed.—William K. Braasch, in address before The Executives' Club of Chicago.

low us greater leeway, and that expressed confidence we must not violate.

One municipality in Ohio now gives us the right to trim limbs not greater than one inch in diameter, not farther away than three feet from our wires, without securing the permission either from the property owner or the Shade Tree Commission.

We don't suggest that anything be stirred up along these lines, but when changes or new legislation is contemplated, we want to sit in with them and explain our problem, which is their problem.

We can show how shade tree authorities agree, that trees in the residence districts should be properly planted inside the sidewalk, as is now required in many of our newer cities, where the street and sidewalks may be properly illuminated at night, where the trees will never have to be removed for street widening, where they have better soil and moisture conditions and are away from the traffic hazards. It would mean much to us if the park strip were free of trees, whether overhead or conduit construction was necessary.

Some states have the control of the highway trees placed in the highway department. A leaflet of the Michigan Highway Commission sets down how the trees shall be placed and trimmed, and where the various wire-using companies shall place their poles. Contemplate what it would mean, if after getting the owner's permission, it would have to be approved and inspected by the state, before the work could be started.

We know how a tree grows by adding to its height and spread, the exact measurement of the new growth. We know that the feeding roots are out at the extreme ends of the larger roots, the tiny rootlets or root hairs. We know that these rootlets gather up food in liquid form from the soil, and that it is carried up to the leaves through the outer layers of wood, the sapwood. By means of the sunlight, the leaves change this raw food into the food of growth, giving off oxygen and water in immense quantities and absorbing carbon dioxide from the air. This changed sap, the sap of growth, then passes downward through the cambium in the tree.

So we see why we shouldn't leave stubs, because there are no leaves above it to furnish the food of growth, and it dies back to this downward flow. We see why leaders should be cut back to a live branch. We see why we should make the cut smooth, so that the new bark can grow over easily and quickly We learn why we should use care in cutting off the big limbs so that they won't split down into the trunk.

We know a little about insects and fungus diseases, so that we see the reason for painting the large cuts to keep out boring insects and decay.

We know how to plant a tree properly, so that when we see an individual planting underneath our wires we cannot only urge him not to plant it there, for the sake of the tree; but he will take our information with better grace if he feels we know what we are talking about.

Compared to the conditions that the lineman of the past worked with, we today have it pretty easy; though, perhaps, with the respect and care we give our roadside trees, this will be a condition that he of the future will work with. It would be some job to remove dead wood from those giants.

What Foresight Is.

Anybody can possess foresight if he will first look backwards; also, he must take care of the present before he attempts to go ahead.

Foresight is merely learning lessons from the past, meeting the needs of the present, and from the lessons of the past and present, anticipating the needs of the future.—R. A. Long, Chairman, Long-Bell Lumber Co.

In all of our work, the little booklet "Standard Tree Methods" is our "Bible." It is really a resume of the points we bring out, with some added information for reference as to the identification of trees and their normal growth so that our men can ask the owner for permission to trim "that maple tree" and not just "that tree," and they won't mistakenly ask for an oak tree clearance or a poplar.

In our education of the public, we are using every means possible. We invited them into these meetings and let them know our exact problem and how we are attempting to work it out. We explained to the newspapers that we felt our work was a matter of public interest, and in connection with out meeting secured over 2,000 column inches in over 70 cities in this state alone. These 100 odd newspapers have a total subscription of almost two million people, so you can see that we have definitely committed ourselves.

Again has arisen agitation for the planting of memorial trees. Through the cooperation of the Cuyahoga Council of the American Legion, a little booklet was prepared explaining what Cleveland has done in perpetuating its heroes in its famous Liberty Row, the first memorial planting in America. The Department of Ohio of the American Legion mailed out for us these little folders to the commander of every American Legion Post in Ohio—485 of them.

In our opinion the rural highway is no place for trees of that character to which such a deep feeling is attached; not wholly because of wire-using companies but because road widening, underground construction, gas stations, hot dog stands and traffic hazards absolutely preclude a chance that those trees will ever mature.

There is no community that wishes to express itself in this beautiful way that does not have a boulevard, a park or a publicly-owned tract large enough for such a planting, where the trees can be properly planted and properly cared for, where 100 years from now the descendants of those men may go out and pay them reverence. The little booklet, as was stated in the conclusion, was meant, "not as a criticism, but rather as a guide to what we see as the proper fulfillment of a beautiful expression."

"Trees and the Telephone" is an enclosure that we are including with the bills to each of our 450,000 subscribers this month. It's simply another way of presenting our problem to the public.

We explain our problem to them by radio, by talks before service organizations, Kiwanis Clubs, Rotary Clubs, taking advantage of any opportunities to tie up our problem with their activities or interests.

Some organizations are fostering the beautification of their highways within their particular district. We try to get before them and present our side, not antagonistic, but really cooperative. We explain what our good service to them requires and at the same time give them suggestions as to what other localities have done in similar roadside improvement.

The ideal way to beautify a rural highway is not the formal, monotonous planting of tree after tree in systematic rows. Nature doesn't plant that way. Real beautification means more than planting; it means a study and care, the hiding of unsightly cuts by means of vines and shrubbery, adding color with herbaceous perennials, the grouping of trees in little naturalistic plantings and, perhaps, even cutting out trees to present to the traveler, a beautiful vista through them.

When the people, as a group or an organization feel that we are not the butchers, the monsters, that they have been led to believe, when they feel that we are interested in such community endeavors, that we are frank with them in presenting our side before the trees are up in the wires, there will be a better feeling towards us on the part of them as individuals.

Our company is but one of the 453 telephone companies serving this same territory and what we do, what program we adopt and carry out, to improve our interfering tree problem will be of slight importance to the public if the other wire-using companies of the state do not wholeheartedly cooperate.

It's the hearty endorsement of those people who know about our work, people of our state interested in phases of conservation and rural beautification, and others without, Gifford Pinchot, Theodore Roosevelt, the master of the National Grange and many others, that make us feel sure that we are not only off on the right foot, but that our direction of march is properly compassed.

THE Norwegians are a pure race, preserving all the characteristics of their Viking ancestors. As becomes the descendants of the Vikings they are matchless sailors, and always have been essentially a seafaring people.

In spirit Norway is one of the most democratic countries in the world. Norwegians are courteous and hospitable to strangers; and in the realms of art and literature they strike a clear and distinctive note. They were pioneers in such political experiments as the public control of the liquor traffic and the extension of the franchise to women.

It is only within the past century that the people of Norway have begun to develop institutions in their own homeland which have exercised a direct influence on European civilization. They have welcomed "Strowger" because they recognize in it the same characteristic in communications—"the survival of the fittest"—which has marked their own national development from the Vikings of old.

Upwards of 3,500,000 Strowger Automatic Telephones installed or under construction throughout the world

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The oscillograph has revealed many characteristics of electrical circuits which have been hitherto unknown. Because of the highly complex nature of the electrical currents traversing telephone circuits, this instrument has been invaluable in discovering the reactions which take place in these circuits under operating conditions.

STROWGER

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HE Research and Development Engineers of Automatic Electric Inc. use many sensitive and complex instruments which enable them to *exactly* rather than to guess what occurs in any circuit. The llograph, for example, accurately records the reactions in an electrical it during any given period of time, even to the very smallest fraction second,. by means of a sensitized film rotating at a high rate of speed, which are focussed several narrow beams of light which are controlled urrent changes.

development of Strowger Automatic telephone equipment to its ent state of highly satisfactory and economical operation, has not been to chance or guesswork. It is the result of detailed and scientific by highly trained and experienced engineers, using the latest and experimental equipment and methods known to the world of science. reliability and efficiency which have become synonymous with the e Strowger have resulted from a consistent policy of development reby new ideas are always subjected to the conservative judgment of experience.

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Here and There in Telephone Work

Engineers Report Progress in Telephone Cut During Year Past.

In the annual report of the committee on communication of the American Institute of Electrical Engineers, reference is made to progress in the telephone branch of the electrical communication act. Among other things the report says:

"The rapid application of dial telephone systems has continued. During the year about 500,000 dial telephone stations were installed, bringing the total in service in this country, as of January 1, 1927, to approximately 2,400,000.

A means has been developed for remotely operating small magneto telephone plants where this is desirable. The name applied to this means is the semi-automatic magneto exchange.

In a system of this type the subscribers' stations are equipped with magneto telephones. Connections are switched remotely by means of automatic telephone apparatus under the control of an operator, who employs a dial trunk from a control center into the exchange area. Any number of such exchanges may be controlled from the operating center.

Further progress has been made in the development and application of methods for increasing the speed of toll telephone service. The plan, the so-called A-B method, of handling the large volume of messages between nearby points in a manner quite similar to that used in handling local traffic, has been considerably extended. The improvement of service has progressed to a point where even at the longer hauls it is now possible in many cases to complete a toll while the calling subscriber remains at the telephone.

An important factor in this improvement is the development of a method of operation combining the work of the line and recording operators so that, if the number of the called telephone is given the recording operator, she can proceed at once with the handling of the call.

A new type of toll switchboard has been made available for toll centers having sufficient traffic to require separate toll and local switchboards. The signaling equipment which was previously located in the cord circuits has been transferred to the line and trunk circuits and use has been made to a considerable extent of common positional equipment."

Commenting on the completion of the long distance cable link between Chicago and St. Louis, the report continues:

"This cable forms a part of the network of cables connecting Chicago, Detroit, Toledo, Cleveland, Pittsburgh, and other cities with the cities on the Atlantic seaboard, and contains circuits for both very long-haul and short-haul telephone business. The longest circuits of the network are about 1,500 miles in length, but even this does not represent the maximum distance over which circuits of this type can be operated.

Telephone repeaters on these circuits are spaced at intervals of approximately 50 miles. Echo suppressors are used to permit operating with volume efficiencies comparable with other long distance telephone circuits. Automatic regulators are employed to compensate for the effect of temperature in changing the attenuation of the cable conductors by suitable changes in the amplification of repeaters in the circuit.

The new link is 344 miles in length. It provides more than 250 telephone circuits, and over 500 telegraph messages can also be sent simultaneously, making it the equivalent of 10 heavy pole lines of open wire."

"An interesting example of the rapidity with which new developments are finding their way into practical use is to be found in the extensive application of carrier-current telephony and telegraphy to the long distance open-wire telephone circuits of the country," the report says in discussing this development.

"There are now of the order of 100,000 miles of long distance telephone facilities provided by carrier methods and some 250,000 miles of telegraph facilities so provided.

The recent growth in carrier-current circuits results from the progress which has been made in perfecting the performance of the apparatus itself and in the development and standardization of methods for coordinating a large number of carrier systems upon the wires of a pole line.

The use of carrier-current telephony for communication on power transmission lines has increased appreciably. The power circuits involved vary from those of 22 kv. to 220 kv., and the distances communicated over vary from a few miles to those in the order of 300 miles.

With the increased application of this form of communication, the demand is rapidly increasing for multiple communication channels, particularly in connection with the more extensive individual power systems where load dispatching is divided into districts, and in the case of the rapidly-growing number of transmission line inter-connections between the large power systems."

In commenting upon the loading of telephone circuits, it is pointed out that an outstanding development in loading coil design, which has been put into commercial use in the past year, is the use of permalloy in compressed powdered form in the cores of some types of these coils.

The application of this desirable magnetic material has resulted in material reductions in both the size and cost of loading coils. The lower cost of loading resulting from this and the other improvements in loading coils is, together with the large installations of toll cable in this country, bringing about a very large increase in the use of loading coils.

Washing Insulators of Line Across Great Salt Lake Desert.

How an interesting maintenance engineering problem on the central transcontinental telephone line was solved was told by B. F. Howard, electrical engineer of the Mountain States Telephone & Telegraph Co., Denver, Colo., in a paper presented at Pacific Coast convention of the American Institute of Electrical Engineers, Salt Lake City, Utah.

The transcontinental telephone line crosses the great Salt Lake Desert near Salt Lake City, Utah, between Clive and Wendover on 20-foot, 7-inch western red cedar poles with 176-foot spans.

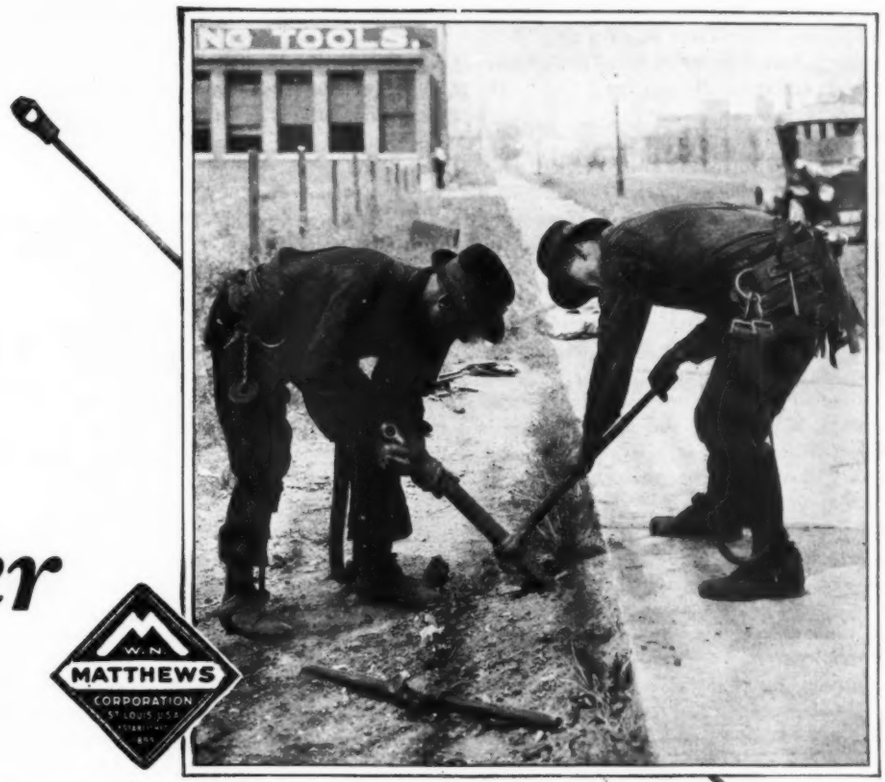
The great Salt Lake Desert is made up of mud flats and salt beds. Investigation showed that salt is blown upon insulators during storms and splashed by the action of wind. This salt forms a crust on the surface and when this takes place on the interior of the insulators, the insulation of lines is materially reduced.

During fogs, which are very prevalent during certain seasons of the year, this salt becomes wet and insulation falls rapidly to a very low value. At such times it has been observed to fall to values as low as 0.09 megohm per mile. A study of this leakage problem brought out that the solution to prevent these reductions of insulation was to remove the salt by washing the insulators from time to time.

The problem of washing the insulators was a somewhat serious one because, if it were necessary to take the insulators down, it would mean interruption to service and damage to the conductors by undoing and retying the tie wires, and this would be a long and expensive process. Mr. Howard, therefore, devised a method by which the insulators could be successfully washed from time to time without climbing the poles or untying the wires.

This method consists in spraying the insulators with saturated steam or finely-divided hot-water spray. Of course, the recognized aging action of steam on glass surfaces might make it undesirable to adopt generally such a method for cleaning insulators, but under the unusual conditions prevailing in this case, the method described seemed justified.

The steam is applied through a nozzle at the end of a fishing-rod device which



Two men, in just a few minutes, put this Matthews Scrulix Anchor in place. No time lost in digging. No stub required.

Look for "SCRULIX" on the Helix

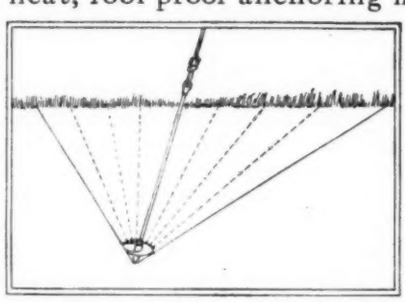
Under the Pavement

but no digging was neccessary to put it there

This illustrates just one of the many advantages offered by Matthews Scrulix Anchors.

TROUBLE-PROOF

Matthews Scrulix Anchors reach your men complete, ready for installation. No moving parts to become lost or to be buried unadjusted. No adjustments are necessary. Only the eye need protrude above the earth, making this an exceptionally neat, fool proof anchoring method.



The helix of Matthews Scrulix Anchors is so designed that under strain the lines of force radiate from the anchor helix at 45° so that hundreds of cubic feet of earth hold the anchor in place. This principle in Matthews Scrulix Anchors gives them tremendous holding power.

SEVEN SIZES

To meet every type of need for dependable anchorage, Matthews Scrulix Anchors are made in seven sizes. For all ordinary requirements comparatively small and very convenient sizes prove entirely satisfactory.

GET COMPLETE INFORMATION

Write for Bulletin 801. Read the interesting details of installations and gain more thorough knowledge of Matthews Scrulix Anchors. See just what they may mean to you. We will gladly send this bulletin upon request.

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is held under the insulator to be cleaned. The steam is generated in a portable boiler which is heated by an oil fire. The temperature is automatically governed so that the steam is kept at about 70 to 90 pounds pressure per square inch.

When an insulator is to be washed, after the nozzle has been placed in position, a valve is opened and the steam forces the water out of the boiler through a pipe leading to the nozzle, and it passes out in the form of a finely divided spray or wet steam. An automatic arrangement of pumps supplies water to the boiler to replace that which is used.

It is advisable to mention that in this location, economy in the use of water is important, as water is a large item in expense; therefore, the time necessary to wash an insulator has been carefully ascertained as 30 seconds. All fresh water has to be carried out to the machine from a considerable distance. It is brought by the railroad, distributed at intervals along the line, and then rolled out in barrels across the mud flats.

During the time when an insulator is being washed, no appreciable disturbance has been noticed in the service taking place over the lines. The rapidity with which salt or alkali dust, both of which are of a stubborn nature, is removed by the steam, is astonishing. To give an illustration, a broken glass insulator, encrusted with salt to the thickness of half an inch, was subjected to the spray, and in less than a minute after the steam was applied, the glass was completely cleaned.

The steam washing plant is built with wide metal tires and is pulled sometimes by horses and at other times by a Ford car, which is also equipped with wide tires. These are fitted on the usual type of demountable rims so that it is easy to change quickly to rubber tires when necessary. Many miles of the mud have been found so soft that it was necessary to lay planks in order to keep the car and the steam-generating plant from sinking. These planks were taken up after the machines had passed over them and relaid in front.

It has been found necessary to wash the insulators at least once every two years but the frequency, of course, is governed by conditions of salt deposit. When the insulation resistance is found to drop to a predetermined amount, it is time to arrange for a washing of the line. While this is in process, the improvement in the insulation of the wires may be observed as the washing proceeds.

The following example of some insulation measurements made in 1923 between a wire and ground show the effect of washing the insulators.

Insulation in megohms per mile—January, 11.37; March, 32.3; June, 101.6; August, 68.2; October, 637.0.

When the insulation had fallen to so low a level in January, when dry, it was decided to wash the insulators as soon as conditions on the mud flats would permit, since in wet weather it would go to about 0.5 megohm per mile. Accordingly, they were washed after August. The table shows how the insulation rose from 68.2 megohms per mile to 637.0 after the washing. Both of these months were comparatively dry months.

The cost of washing the insulators on the mud flats ranges between $500 and $700, according to prevailing conditions.

Types of Telephone Protectors.

By Ray Blain.

We all know that some kind of protection is necessary on all exposed telephone lines. We also know that the average protector in common use at the present time is considered rather expensive to maintain. The troubleman is always busy the morning after a severe electrical storm visiting subscribers' stations to clean and renew carbons.

It has been said that one should always be glad to repair or replace a carbon that is blistered, for it is an indication that the equipment has been saved from lightning harm. This is all true, but if there is some kind of a gap that will drain the harmful potential to ground and leave the line clear, thus saving a visit of the troubleman to overhaul the protector, then it should be a good investment.

I have been of the opinion for some time that the carbon block and mica was not the ideal type of arrester for telephone lines. The copper block is suitable under some conditions, but is more expensive and not of the self-cleaning type.

Substation protectors are generally installed in the basement, and the basement is usually damp. The soft carbon block absorbs moisture like a blotter, and a damp carbon block causes a high resistance lead to ground, thus lowering the insulation resistance of the line. The problem of keeping dust from between the blocks, especially on main frames, is a serious one and causes numerous troubles.

The carbon block is difficult to maintain properly, and if not properly maintained is a constant source of trouble. The average troubleman thinks it is perfectly all right to scrape a blistered carbon with a pocket knife or rub it on the roof of the pole or to use any other means to clean it.

Such treatment alters the adjustment between the blocks and alters the protective qualities of the arrester. I have found blocks with as many as four micas between then, which would make them just about as effective to harmful lightning discharges as dummy or wooden blocks.

While in the Philippine Islands for two years on telephone work, I learned that the carbon block was more of a detriment than a benefit, due to the high humidity of the climate. On account of the presence of the large amount of moisture, it was practically impossible to maintain lines with this type of protectiton.

A number of vacuum arresters of the type commonly used on radio receiving sets was obtained and tried out with wonderful results. It was found that they were not harmed by the excessive dampness, that they were self-cleaning, and required practically no attention. If an arrester of this type does cost more, I believe that the saving in maintenance more than makes up for the increased first cost and the service would be generally improved.

I do not say that there is not a reason why this type of arrester is not as desirable as the carbon block and mica for telephone work, but to date I have failed to find any. I also believe that a vacuum type gap could be designed which could be enclosed in a small container similar to a cartridge fuse and snapped into clips on the main frame, to replace the usual carbons.

An arrangement of this kind I believe would be a big improvement in many ways over the present main-frame type of arresters.

Commercial Survey Service Proves to Be Revenue Adder.

A service that the Lincoln Telephone & Telegraph Co. of Lincoln, Neb., is offering has proved to be a satisfactory revenue adder. This consists of making a commercial survey of the telephone needs of every business man with a considerable volume of business. By studying his loads as to character and number and the traffic conditions on his board, the company has been able to intelligently advise him as to what additions he should make. In some cases this results in losing an order for additional trunks on a private branch exchange or possibly a reduction of them, but as this is in the interest of service and goodwill, it is believed to pay well.

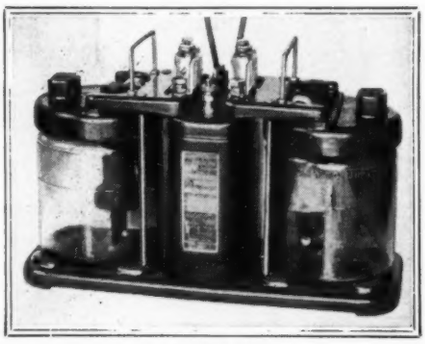
In a number of cases where business men complained that their trunking capacity was not sufficient for their needs and that callers had to wait or turn elsewhere, studies have shown that a great percentage of the load was social and personal conversations by employes and had nothing to do with the business of the houses. An order not to use the telephones for private matters cleaned up the situation each time, and gained a staunch friend for the company.

These surveys go into location of sets, extension of use of toll lines, all the various elements entering into good service which the average subscriber but dimly comprehends but which expert advice can secure.

Two new skyscrapers, just completed, gave the survey groups a comprehensive job. A study was made of the rooms and suites of offices before the tenants occupied them. By conference with the latter and a knowledge of their needs, the company was able to plan a high grade of service for all patrons in these buildings.

You can now charge telephone batteries without removing them from service

Balkite Trickle Charging makes storage batteries a permanent source of power



TYPE RB

Balkite Chargers for Telephone Service

Type RB shown above is a universal unit operating from any 115 volt AC supply of from 25 to 140 cycles. It will charge from 7 to 12 cell (14 to 24 volt) storage batteries at rates up to ¾ ampere.

A smaller unit (type RA) is also available for charging lower voltage batteries. In most cases these units can be used for charging telephone batteries without producing undesirable noise in the telephone circuits. A simple compact Balkite filter unit can be furnished in the few cases where it is necessary.

A complete, interesting, authoritative booklet fully describing the system, its applications, and advantages, is available on request.

Write for this booklet

Fansteel Products Company, Inc.
North Chicago, Ill.

Please send me a copy of bulletin TC-8 describing the new Balkite Chargers.

Name_____

Address_____

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Position_____

Tel. 8-27

Removing storage batteries for periodical charging usually causes an interruption of service. Furthermore, during the period before the charge is given, the battery is low and you cannot operate with full power.

Now this is unnecessary. Balkite Trickle Charging makes your batteries a permanent source of power by making possible the installation of a charger and battery as a complete unit to supply unfailing Direct Current from an Alternating Current source.

In this system a Balkite Charger is connected to the storage battery and left on continuous [Trickle] charge. The rate of the charger is adjusted so that it replaces continuously in the battery the energy that is taken out of it by use. The result is a battery fully charged at all times without attention.

Besides providing convenience and permanence, Balkite Trickle Charging also prevents the possibility of power failure because, in case the AC line fails temporarily, the battery has stored in it enough energy to operate the system until the breakdown is repaired.

Trickle Charging is made possible by the Balkite Charger. This charger is noiseless in operation, has no moving parts and nothing to wear out, causes no inductance disturbances in electrical circuits, operates satisfactorily under practically any extreme of temperature, and requires no other attention than the occasional addition of water. Its low first cost and freedom from replacements make it an extremely economical unit that can frequently be used with a storage battery to replace dry cells at a decided saving.

Wherever you use batteries, Balkite Trickle Charging will improve and simplify the service they give you.

FANSTEEL PRODUCTS COMPANY, Inc.
North Chicago, Ill.

FANSTEEL
Balkite
Battery Chargers

How Time on the Air Is Measured

Transatlantic Telephone Calls Necessitate Careful Timing Because of High Rates Involved—Development of Calculagraph, Used for This Purpose—First Model in 1893—Now Used by 99 Per Cent of World's Telephone Companies

By N. W. Jarvis

When an American manufacturing executive, for example, lifts up his telephone receiver to call a party in Europe via the New York to London radio telephone circuit, and holds a conversation at $25 a minute, it is necessary that the duration of his long distance call be timed with the same exacting accuracy necessary in recording the elapsed time of the workmen in his factory. In both cases, the time which elapses is a matter of dollars and cents, for which the modern business man has a good deal of respect.

And right here, in the measuring and recording of elapsed time, is a problem which the telephone engineer and the factory executive have joined hands in solving. The most modern methods of recording elapsed time have been rigorously tested by both telephone and industrial engineers in their efforts to establish a basis of constant accuracy in their records of time-duration, whether in periods of a fraction of a minute, or in duration of hours.

According to the practice now found in the exchanges of the American Telephone & Telegraph Co., the most satisfactory method for the telephone engineer is the use of a separate message ticket for each call, on the back of the ticket stamping the time of beginning conversation together with the exact time elapsed during the call. This is done simply by inserting the message ticket into a calculagraph, and pulling a lever.

This automatic calculating machine is, therefore, found at the hand of the line operator in the A. T. & T. Co. long lines offices everywhere. Indeed, every time a long distance call is made, the duration of the call is recorded by this ingenious machine, for it is said that the calculagraph is today used on the toll boards of 99 per cent of the entire world's telephone companies.

The use of this unvarying method of time recording was not adopted by the A. T. & T. Co., however, through a selection of newly-developed modern ideas. On the contrary, it was arrived at 33 years ago, and has been gradually developed to meet the ever increasing needs of the great telephone organization.

One day in the fall of 1893, F. A. Pickernell, then chief engineer of the American Telephone & Telegraph Co., was visited by a man with the first crude model of the calculagraph tucked under his arm. Mr. Pickernell was engaged in an experiment with 15 electrically-operated clocks wired on a circuit with a battery and a master clock, but he was having trouble making them all move simultaneously. His visitor was Henry Abbott, then proprietor of a shop in which step-winding attachments were produced, at 4 Maiden Lane.

When Mr. Abbott left the A. T. & T. Co. office in Cedar Street, he had begun a relationship which has lasted ever since. His elapsed time recorder, which had been invented during the great New York blizzard in March, 1888, was tried out at the Cortlandt Street operating room of the company. After some difficulties and changes in the design of the original model, experiments and tests were continued in the Cortlandt street office under J. S. McCulloh, now president of the New York Telephone Co., then chief operator, and on March 8, 1894, the first machine was bought.

The First Model of the Calculagraph.

That year single machines were sent to exchanges in Philadelphia, Boston, Chicago and San Francisco. On April 6, 1895, 20 machines were installed on a new switchboard set up in the operating room of the A. T. & T. Co. in Cortlandt street, New York.

The development in the use of the calculagraph is shown in the light of an interesting contrast when the situation of 1895 is placed beside that of today. Now we find at the company's long lines office, 24 Walker street, New York, a system of 1,700 long lines circuits handled by a force of some 2,500 persons. Lines reach out to such distant points as Atlanta, 900 miles away; St. Louis, 1,000 miles across country; Havana 1,710 miles of land and water travel. Through no more than two intermediate connections, other lines stretch 3,360 miles to San Francisco, and 4,000 miles to the Catalina Islands.

Every day 30,000 toll calls pass through the Walker street switchboards, and the duration of every call is timed accurately and promptly recorded in permanent form, down to the quarter of a minute!

Perhaps in no other industry is time a

Switchboard at 24 Walker St., New York, Through Which London Calls Pass. Calculagraphs Are Mounted on the Switch board Between Every Two Operators.

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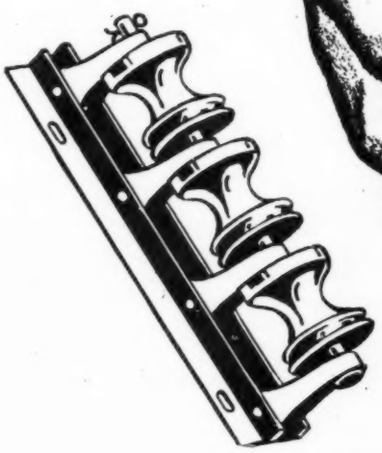

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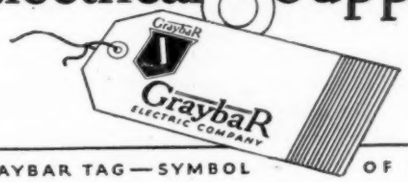

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factor of greater importance. When business men are glad to pay $25 a minute for talking over the air through the New York to London radio telephone circuit, considering it a matter of economy to do business by this magically modern avenue which science has opened up for them, they are buying space on the air at a rate which makes it important to both subscriber and telephone company that the measurement of the time consumed should be accomplished with the greatest possible accuracy.

Here is a situation which permits no excuse for error. And the business man who uses this convenience—especially if he is a manufacturing executive—can well afford to heed the long experience and thorough success of the telephone engineers in all problems having to do with measuring time periods; for it should be remembered that this problem of calculating the duration of time for any given operation in manufacturing, is a problem which comes up in many other industries.

Because his industry is supplied with machines by The Calculagraph Co., if you take this question to a telephone man, he is likely to send you to the offices of the manufacturer at 50 Church street, New York. Because this company has for many years progressed under his guidance as president, there you will find Henry Abbott prepared to tell you how the elapsed time recorder, so popular among telephone companies, is likewise gaining popularity in lines of industry where it is less well known.

"There are still many people from Missouri who have to be shown," says Mr. Abbott; "but, whereas in the year following the great blizzard of 1888, calculagraphs were as rare as a first edition out of print, now they are common and can be found in every civilized country in the world."

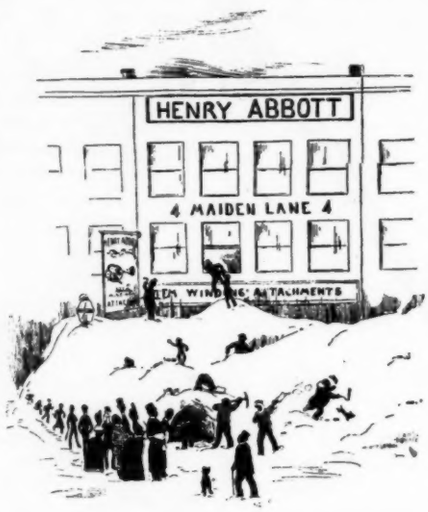
Among industrial concerns, those which have been quickest to adopt and use the elapsed time recorder, are firms whose production is carried out in part or wholly on the basis of paying labor according to the actual working hours put in. Thousands of such concerns, like the telephone companies, have been familiar with the recorder for the past 30 years.

As you discuss his company's elapsed time recorder with Mr. Abbott, he will sometimes refer to quotations from the many books which have been issued under his supervision on the subject, and from one of these we gather the following:

"Workmen may make no actual notation of starting and finishing times on their job but merely put down the 'time taken' and these records are called 'elapsed time records,' but the chances are better than even that they are wrong and practically worthless for real cost purposes.

Workmen may write the starting and ending times of their jobs with a pencil, but there are chances for errors in both records, for mechanics are not accustomed to clerical work and are usually exceedingly careless about it. It is then necessary for the workmen or a clerk to subtract one of these questionable 'records' from the other—a tedious and costly clerical operation, when hundreds are performed daily, and introducing further chances for error.

The ideal time recorder, therefore, for



Shop of Henry Abbott, 4 Maiden Lane, New York, Where First Plans of the Calculagraph Were Drawn During the Great Blizzard, March, 1888.

labor costs and payroll is one which prints not only the starting and finishing times on the workman's time card, but also automatically computes and prints down the actual elapsed time—the actual time in hours and minutes which the workman has spent on any given job—eliminating all possibility for errors and clerical expense."

"American industry is more and more waking up to the fact," says Mr. Abbott, "that vast sums are wasted every year because of obsolete and careless methods of recording and computing elapsed time in shop and factory. The modern business man has learned to insist upon his check-writing machine, his adding machine, his bookkeeping machine, and many other mechanical devices which afford him protection of outgoing payments. But perhaps the best example of the value to him of guarding the time of his workmen, on which their wages are paid, is the example offered by the telephone companies in the use of our machine for measuring time duration on toll calls."

Kingfisher (Okla.) Paper Speaks Highly of Telephone Company.

The "Progress" edition of the Kingfisher Weekly Free Press, Kingfisher, Okla., which gives accounts of the various improvements and developments made in its community, devotes a share of its pages to telling of the Kingfisher Telephone Co., which "is contributing to the growth and expansion of Kingfisher and the surrounding territory." An illustration of the central office building, which is located in the business center of the city, accompanies the article.

"Charles B. Ford, the manager of the company," the paper says, "has organized a force of efficent employes for his company who are loyal and who are constantly striving to accord the general public with better service, for which the company has established a reputation."

The concluding paragraph of the article says, "We believe Kingfisher and the territory served by this telephone company can boast of a service of which any community might well be proud. It is with no small degree of pleasure that we point out in this special number the strong evidences of progress being made, and we believe we can claim the concurrence of every subscriber to this company's service, in this statement of appreciation."

New Telephone System to Be Installed at Osawatomie (Kans.).

In line with the steady growth and progress of Osawatomie, Kans., the Osawatomie Telephone Co., of which T. L. Youmans, president of the Kansas Independent Telephone Association, is owner and manager, announces that it is soon to have a completely new and up-to-date telephone system.

Approximately $25,000 will be expended by the company in remodeling the building, installing new central energy switchboards, laying additional conduits and cables and in replacing present receiving sets and other equipment, with the most modern and up-to-date instruments. Mr. Youmans states that orders have already been placed for new switchboards and a part of the other new equipment.

Work will begin at an early date on remodeling the building, reconstructing lead lines and conduits preparatory to cutting the entire system into the new exchange with practically no interruption.

New Overhead Cable Span Across Columbia River.

A new overhead span of telephone cable recently has been completed across the Columbia River, a few miles north of Wenatchee, Wash.

This cable, which is of unusual length for telephone spans, carries wires that were formerly open and serves as a link in the new northern transcontinental telephone circuit. The cable is supported by steel towers and is high enough to clear high water navigation.

Prices in the Metal Markets.

New York, August 15.—Copper—Steady; electrolytic, spot and futures, 13.37½c. Tin—Quiet; spot and nearby, $64.50; October, $64.25. Iron—Steady and unchanged. Lead—Steady; spot, 6.75c. Zinc—Firm; East St. Louis, spot and futures, 6.40c. Antimony—Spot, 12.00c.

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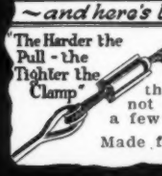

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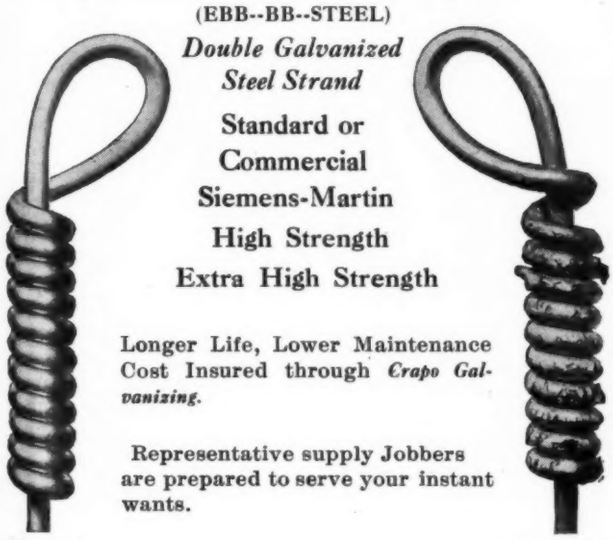

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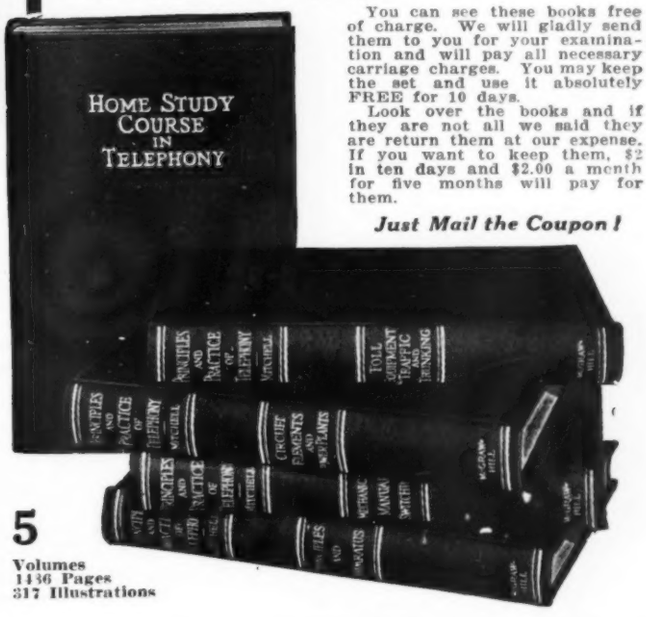

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What the Commissions Are Doing

Up-to-the-Minute News Regarding the Activities of State and Interstate Commissions, Courts and City Councils in Matters Concerning Telephone Companies—Summary of Commission Orders and Schedule of Telephone Hearings

Rules Companies Must Move Poles for Road Widening.

The Nebraska State Railway Commission has ruled, in passing upon a request from the Hill Independent Telephone Co., of Bloomfield, that where the state widens and improves a highway in such a manner as makes necessary the setting back of the existing telephone company pole line, the expense of the removal must be borne by the telephone company and cannot be charged up against the state and collected from highway funds.

This is on the theory that the free occupancy of a public road on the part of a telephone company is always subject to the exercise of proprietary rights on the part of the state as owner, and any expense incurred in such exercise, insofar as it is occasioned to the holder of the easement, must be borne by the latter, since it holds no vested right in that portion it uses.

Temporary Injunction Against Sale of Clinton, Mo., Company.

On August 9, James A. Parks, representing minority stockholders of the Missouri Union Telephone Co., Clinton, Mo., asked for and secured an order from Circuit Judge Charles A. Calvird, restraining Geo. W. Schweer, general manager and secretary of the Missouri Union Telephone Co., from turning over the books, records, abstracts of title to real estate and other property, to Herbert L. Nichols of Chicago, or his assigns.

This action has followed an agreement several weeks ago for the sale of stock in the Missouri Union Telephone Co. to Mr. Nichols. At that time it was stated that J. M. Spangler, W. E. Owen and G. W. Schweer, owning a majority of the stock, had given an option to Mr. Nichols to purchase their stock by September 1.

At the time Dr. S. T. Neill, owning a considerable block of the stock was traveling in the west, and it was stated that he and other minority stockholders were privileged to come in under the same terms of sale of their stock which were accorded to the three majority stockholders. Since then, Mr. Nichols has formed a new corporation known as the Standard Telephone Co., incorporated under the laws of Delaware, to purchase and hold telephone properties in the states of Iowa, Illinois, Michigan and Missouri.

Of the 1,600 shares of capital stock of the Missouri Union Telephone Co., Dr. Neill in asking for the restraining order spoke for his holdings and those of other small stockholders, in all, representing 428 shares.

The restraining order prohibits General Manager Schweer from turning over to Mr. Nichols or his assigns the charter, franchises, books and records, the abstracts of title of the various buildings owned, or to permit Mr. Nichols to make any examination of the books and records of the company.

Judge Calvird, in granting the restraining order, fixed August 17 as the date of hearing of evidence and to pass on whether the restraining order would be made a permanent one.

A petition has been filed with the Missouri Public Service Commission asking that the sale of stock by Messrs. Spangler, Owen and Schweer to Mr. Nichols be disapproved, and requesting a hearing thereon.

Mountain States Purchase of Small Idaho Company Approved.

The acquisition by the Mountain States Telephone & Telegraph Co. of the properties of the Meridian Independent Telephone Co., Meridian, Ada county, Idaho, in accordance with the terms of the contract described in the application and a report to the Interstate Commerce Commission has been found by the commission to be of advantage to the persons to whom service is to be rendered and in the public interest.

The Meridian company owns and operates an exchange at Meridian, Ada county, Idaho, which serves 210 subscriber stations of which 126 are rural. The Mountain States company does not maintain an exchange at Meridian but its toll lines connect with the lines of the Meridian company.

March 16, 1927, the Mountain States company contracted to purchase the properties of the Meridian company for $6,000, free from any liens or encumbrances.

An appraisal made by the valuation engineer of the Mountain States company finds the reproduction cost new of the properties, less depreciation, to be $7,565. The estimated value of property to be retired from service is $3,010 and the cost of removing the property to be retired is expected to exceed the salvage therefrom by $213.

In 1926 the receipts and disbursements of the Meridian company were $8,090.56 and $8,021.52, respectively.

Meridian, a town of approximately 1,000 inhabitants, is about 10 miles west of Boise and is within the exchange service area of the Mountain States company's Boise exchange. The Meridian company is controlled by a man of advanced age, who wishes to be relieved of the responsibility for providing telephone service.

For many years there has not been any increase in the number of stations at Meridian and the plant has not been maintained in satisfactory condition. The Meridian company does not desire to make the necessary additions to its plant to meet the increased demand for telephone service.

At a hearing, communications from a number of representative telephone users were introduced in evidence, all favoring the proposed acquisition. The Idaho Public Utilities Commission also had no objection to the transfer of the property.

Allows Schedule Petitioned for Except Rural Switching Rate.

The Minnesota Railroad & Warehouse Commission has approved the petitioned schedule of rates and service charges of the Hewitt Telephone Co., Hewitt, with the exception of the rural switching rate, which is increased from 30 cents a month to 50 cents instead of the 75 cents desired. The company serves 59 town stations, 18 rural stations of its own, and performs a switching service for 140 rural stations served by lines of connecting rural companies.

The old and new gross monthly rates are:

	Old	New
Individual line, business	$2.50	$3.25
Individual line, residence	1.75	2.00
Two-party line, residence	1.50	1.50
Rural multi-party	1.50	...
Rural multi-party, grounded	...	2.00
Rural multi-party, metallic	...	2.25
Business extensions (net)	.75	.75
Residence extensions (net)	.50	.50
Rural switching (net)	.30	.50
Desk telephones in residence additional	...	.25

The usual discounts are allowed on the gross rates. The rural switching rate is to be payable in advance.

The service connection charges and rules authorized are similar to those allowed other companies. The rates are effective as of September 1.

For several years last past, the operating expenses, exclusive of depreciation, have exceeded the operating revenues of the company. For the year 1926, the operating revenues were $2,135.46, the operating expenses, including taxes and uncollectibles, were $2,213.42, without any allowance for depreciation.

The commission did not approve a rural switching rate of 75 cents per month upon

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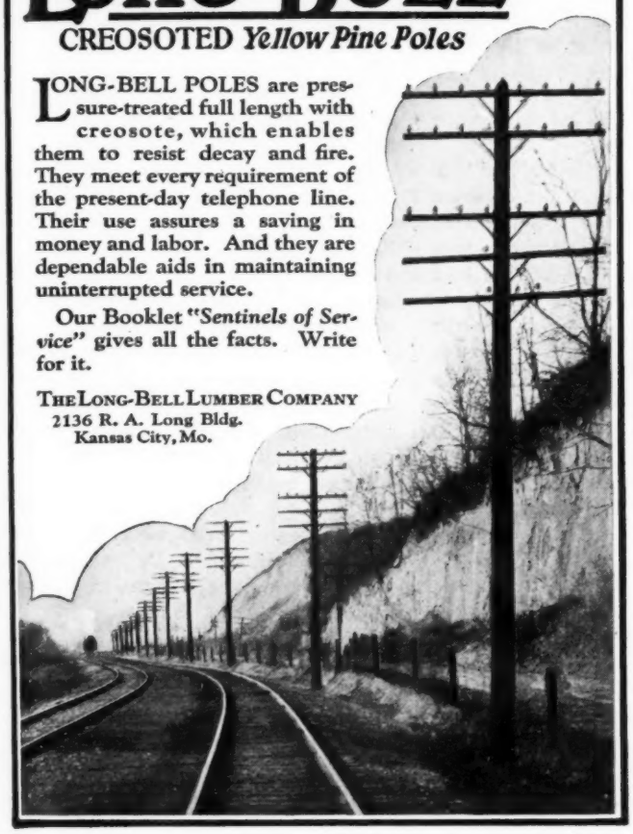

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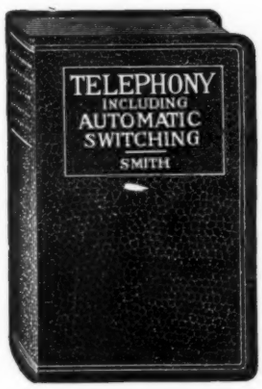

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the showing made by the company but allowed a rural switching rate of 50 cents. It is willing to reconsider this portion of the application upon proper and reasonable showing by the applicant.

The estimated operating revenues under the schedule the commission approved, are $2,822.46 per annum; the estimated operating expenses, including taxes and uncollectibles but exclusive of depreciation, $2,354.35, leaving a net income available for depreciation and return of $468.11. The company's investment in the property as of December 31, 1926, was $3,472.63.

Minnesota Company Granted Rates for Which It Asked.

The petition of the Red River Telephone Co., Northwood, Minn., for an increase in rates at its Climax exchange was granted by the Minnesota Railroad & Warehouse Commission is an order issued August 13 authorizing the company to place the new schedule in effect September 1. The company serves 42 town and 116 rural telephones from its Climax exchange.

The old and new monthly net rates are:

	Old	New
Individual line, business	$1.50	$2.00
Two-party line, business	1.25	1.75
Individual line, residence	1.25	1.50
Two-party line, residence	1.00	1.25
Extension stations	...	.75
Multi-party, rural	1.25	1.50
Desk telephones, additional	...	.25

The total operating revenues for the year 1925 for the Climax exchange were $2,764.37; the operating expenses, including taxes and uncollectibles but exclusive of depreciation, $2,196.80, leaving a net income available for depreciation and return of $567.50. The total operating revenues for the year 1926 were $2,921.02; the operating expenses, including taxes but exclusive of depreciation, $2,310.22, leaving a net income available for depreciation and return of $610.80.

The book record cost of the Climax exchange as of December 31, 1926, was $8,630.27. The estimated operating revenues under the proposed rates are $3,344.02, the estimated operating expenses, $2,343.88, leaving a net income of $1,000.14 available for depreciation and return applicable to the book value of the company's property.

Lineman Guilty of Contributory Negligence Cannot Recover.

While a lineman working on a pole about six feet below a defectively insulated electric wire carrying 2,300 volts, the telephone wire became caught in a limb. His fellow workman pulled the wire out from under the limb and turned it loose. The lineman then jerked the wire and it flew up and came in contact with the light wire, severely shocking the lineman.

The Arkansas Supreme Court on May 16, 1927, in the case of Hines vs. Consumers Ice & Light Co. held that while the telephone company had the right to use the poles of the light company for stringing and operating its wires and that its employes might climb upon the light poles of the defendant for that purpose, still the plaintiff was required to use ordinary care for his own safety while engaged in the performance of his work.

It was further held that plaintiff was charged with knowledge of the defective insulation of the light wires, and should have anticipated that the telephone wire would coil up unless it was stretched, and that when he jerked it, it was likely to do so and fly up and come in contact with the electric light wire; the plaintiff and his fellow workman should have used ordinary care to see that the telephone wire was kept stretched and that it did not come in contact with the defendant's live wire.

The lower court erred in not directing a verdict for the defendant on the ground that plaintiff was barred from recovery under the facts proved by himself on account of his own contributory negligence in the matter.

Says Contract Regarding Toll Line Use Is Fair.

The Farmers Union Telephone Co., of Winnetoon, Neb., answering a complaint filed against it by the Washington & Western Telephone Co., of Verdigre, which also carried with it a request to be allowed to cut connections with it over a toll line it owns into the town of Verdigre, says that the contract complained of was drawn up by the Verdigre company was presumptively satisfactory and fair a year ago.

The defendant says that it does not care to accept the offer to buy a half interest in the toll line so that tolls may be divided evenly, because that would cause it to lose its Verdigre franchise which it desires to keep. It says that the Verdigre company failed to mention that it has free use of the Winnetoon's line into Center, the county seat, and that there are other compensating features of the situation. Its manager has agreed on a flat rate with the other company, and writes that some day he will put it up to the board of directors for ratification.

Chamber of Commerce Resolution Asks for Higher Rates.

Railway Commissioner John E. Curtis of of the Nebraska State Railway Commission says it really did happen, and that he has the documents to prove it.

When he opened the hearing recently held at Cozad on the application of the Cozad Mutual Telephone Co. for a substantial increase in rates, he asked if anybody appeared in opposition. Whereupon, the editor of the local newspaper, in his official capacity as secretary of the chamber of commerce, stepped forward and presented a resolution adopted unanimously by the directors, asking the commission to increase the rates of the company to a point where they would give it a substantial return on its investment.

It developed later in the hearing that of the 806 patrons, none of them is a farmer. All the farm lines in that neighborhood are owned by mutual companies, and are switched by Cozad.

L. H. Foethman, president, and R. G. Miller, manager, appeared for the company. They said that the present revenues are $11,436, while their requirements, if they are to receive an 8 per cent return, call for $19,007.20. The company is locally owned, and is the consolidation of two competing companies that tried to do business 20 years ago. The plant cost $38,000, and has a present value of $30,588, according to engineers' estimates. The town has paved streets and is the center of a prosperous agricultural section.

The present rates are $1.65 for residence and $2.75 for business. The company is asking for gross rates of $4.75 for individual business and $4.25 for two-party, with $2.75 for individual residence service and $2.25 for party.

Small Exchange Closed; Free Service Situation Eliminated.

The Nebraska State Railway Commission has cleaned up an unsatisfactory condition involving free service complained of by both the Palisade and Wauneta Telephone companies by authorizing the former to close up its exchange at Hamlet. Both the companies had connections with this exchange, as had also a number of independent farm lines that paid for switching at Hamlet, but which were able, in this way to talk free to the other two towns as well as Hayes Center.

The farm lines did not like this very well, but finally agreed that it was better than to revise rates and put in toll charges between Hamlet and the other towns. The elimination of the Hamlet exchange will compel these farm lines to run their lines into the Palisade and Wauneta exchanges, and pay regular switching charges. Hamlet people will be given the choice of becoming patrons of one or the other of these exchanges.

The commission found that the Hamlet exchange was being conducted at a loss, the total toll and exchange revenue averaging $30 a month. There were 13 town subscribers and 13 more were served on farm lines. Under the new arrangement the Hamlet business houses will pay $1.75 a month and the residence subscribers placed on the rural rate basis. The Palisade company is ordered to put in sufficient metallic trunk lines to take care of the subscribers, nor more than eight to be put on a line.

The Wauneta company joined with Palisade in asking that the free service situation be cleared up. It has an authorized switching rate which it has been impractical to use in the case of some of the

farmers served since the farm line that pays them for switching patrons between Wauneta and Hamlet connected with the latter, and thus opened territory jn all directions. The company will profit $150 a year by the order.

Asks Rehearing of Commission Case by State Supreme Court.

The Chicago & Northwestern Ry. Co., whose appeal to the Nebraska Supreme Court drew forth the recent declaration on the part of the state's highest judicial power that it considered the state railway commission to be independent of any direction from it, having been endowed by the constitution with legislative, executive and judicial functions, has asked for a rehearing, and in doing so lays the groundwork for an appeal to the federal supreme court.

The railroad attorneys say that the court's opinion leaves the public utilities of the state at the mercy of despotic and arbitrary powers put in the hands of three men, while the remainder of the citizens of the state are left free from the exercise of that sovereign authority. They insist that this results in denying to the utilities the equal protection of the law guaranteed by the federal constitution.

They say that the refusal of the court to interfere with the power exercised by the commission—the case involved the ordering in of an underground farm crossing—leaves the railroads in the same situation as would be the people of the state if they should revise their constitution and put three men in control of the state government.

The opinion is declared to result in setting up a super-government, with all the three general but divided powers of a democracy combined in one for the purpose of dealing with railroads alone. This enables the commission to make the law as it sees fit, and makes civil liberties for public service corporations under it a mockery.

Merger of Bell Companies in New Jersey Approved.

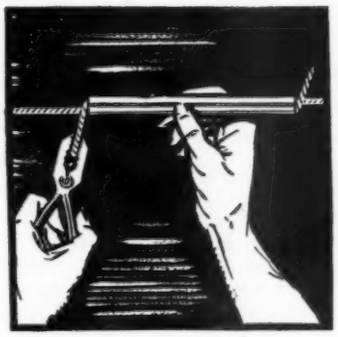
The merger of the New York Telephone Co. in New Jersey and the Delaware & Atlantic Telegraph & Telephone Co. as of January 1 last has been approved by the New Jersey Public Utility Commission. It will be accomplished through the purchase of the property, franchises, privileges and rights of the New York company by the Delaware & Atlantic. The decision of the commission sanctions an issue of $72,416,000 of Delaware & Atlantic par value stock for the purpose.

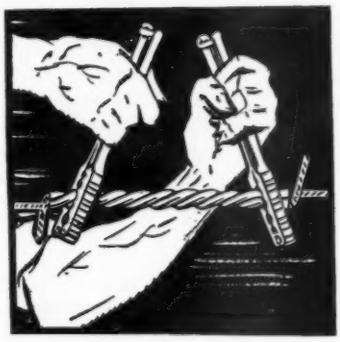
The principal purpose of the merger is to eliminate the confusion resulting from the operation of an interstate business and it is expected to facilitate the administration of the business in other respects. The prevailing rates will not be affected but improvements in the character of the service are anticipated.

Two Valuable Assets

For Line Construction Work

Both Save Time — Assure Security





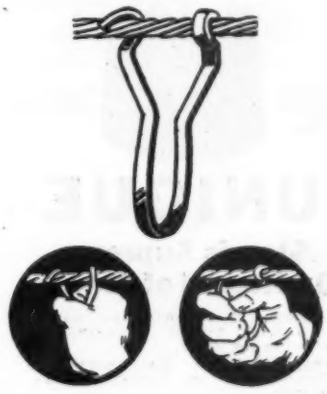
NO matter what kind of a splicing job you have, there's a National Sleeve to help you do it quicker and more economically. And when you do splice with a "National" you know the job will last — even outlast the wire itself.

Because each one meets all the requirements of the ideal sleeve, National Double Tubes have met with instant favor. They have the O.K. of construction men everywhere.

WHEN you hang the cable you must do the work as quickly as possible without in any way sacrificing safety and security.

National Cable Rings are more easily placed on the messenger than any other known hanger. Tests have proven that more "Nationals" can be installed in a given time than is possible with any other ring.

"Nationals" with their "Tension Grip" are absolutely rigid, once on the messenger, and cannot slip or pull off. As they are two-way rings the cable can be pulled either way. "Nationals" on account of the perfectly smooth galvanizing will not sheath cut. Quick and secure, these rings are the ideal hanger. Write today for samples and prices.



The NATIONAL TELEPHONE SUPPLY COMPANY

5100 Superior Avenue Cleveland, Ohio

The systems operated by the two companies in New Jersey are not competitive, the New York company serving mainly the northernly and easterly parts of the state in the metropolitan district and the Delaware & Atlantic company serving the southerly and westerly parts. Trenton is a part of the latter system. It is proposed to give the name, the New Jersey Bell Telephone Co., to the consolidated companies.

As viewed by the utility commission the level of rates between the New York and the Delaware & Atlantic companies was substantially unified by the rate decision of December, 1924. This unification, it is said, removed the chief objection which had existed against the consolidation and merger.

During the hearing, counsel asked that provision be made for the issue of stock to pay for additions to the property in the interval between January 1 and the date on which the sale becomes effective. The board decided that in order that it might have a basis for such increased issue of stock, the applicants could on the effective date submit further proof, upon receipt of which the issuance of securities would be approved.

The board pointed out that the basis of the sale is the book cost rather than the higher value which might be shown on the basis of the reproduction cost new. The board, therefore, believed the basis adopted was conservative.

Although the merger will not lower rates at present there will be no increase and the character of service will tend to improve with local management free from the New York end of the business, the board pointed out.

The board said that the effect of the merger, from the standpoint of regulation, is decidedly advantageous in matters of service and rates. Under the new company, confusion now existing in the operation of an interstate business will be eliminated, the system of accounts will be uniform, and the issuance of securities will be entirely under the regulation of the board. Placing of the entire affairs of the company, especially in rate and service cases, under state regulation will be advantageous to the public interest, the board feels.

PATENTED ARRANGEMENT FOR DISLODGEING COIL WITHOUT TEARING DOWN FURNACE
PATENTED SEAMLESS TUBING COIL GENERATOR
IMPROVED ONE PIECE BURNER
HAND HOLD FOR CLEANER ONE TURN CLEANS ORIFICE
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Linemen throughout the nation have tried Unique furnaces—will now use no other.

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Hearing on Hand Telephone Sets in New York City.

Complaints that the New York Telephone Co. is supplying its patrons with inefficient and antiquate apparatus instead of the best modern equipment were heard by the New York Public Service Commission on August 10 in New York City. Those who complained are the Hickey Contracting Co., by James A. Kenney, its vice-president, and Pettigrew & Meyer, Inc. It was was alleged that the company has failed to supply receiving and transmitting instruments of a type "conforming to the advances made in the telephonic art and procurable at small cost in the open market."

It was explained that what the complainants desire is known as the "French telephone" or hand set, which has receiver and transmitter in a single instrument. The company is willing to supply this new instrument at a cost of $3.50 for installing it and a monthly rental thereafter of 50 cents.

About 1,600,000 telephones are in use in New York City and to install the hand set on all of them would cost the company $8,000,000 to $10,000,000, it was said.

Part of the complaint of the Hickey company stated that the telephone company refused to install the new device "except at a grossly excessive and arbitrary rental charge."

Authorizes Rate Increase When New Plant Is Completed.

The Oklahoma Corporation Commission has granted the application of the Southwestern Bell Telephone Co. for increases in exchange rates at Cordell. The new rates, however, will not become effective until the installation and operation of a common battery plant at Cordell to include both local and long distance facilities in lieu of the facilities now available.

The new rates are: $3.25 per month for individual business, either wall or desk; $2 for individual residence, either wall or desk; $1.50 for two-party residence, either wall or desk.

Court Orders Providence (R. I.) Telephone Co. Dissolved.

A decree of dissolution from Superior Court, Providence, R. I., signed by Presiding Justice W. B. Tanner, dissolving the Providence Telephone Co., was filed last month with Secretary of State Sprague. The decree was granted in the action of the New England Telephone & Telegraph Co. against the Providence Telephone Co.

Ohio Commission Approves Sale of M. W. & O. Telephone Co.

Sale of the property of the Millersburg, Wooster & Orville Telephone Co. to the Ohio Central Telephone Corp. has been authorized by the Ohio Public Utilities Commission.

In order to finance the transfer, the commission authorized the Ohio Central Telephone Corp. to issue first mortgage 6 per cent 20-year bonds in the principal sum of $683,000, $150,000 worth of 7 per cent preferred capital stock and 2,942 shares of common no par stock.

Stock Dividend Authorized by Wisconsin Railroad Commission.

The Wisconsin Railroad Commission recently authorized the Brodhead Telephone Co., of Brodhead, to issue $10,000 par value of its common stock of the par value of $50 per share and to distribute it equally, share for share, among the holders of the common stock of the corporation now outstanding.

The company had $37,500 of common stock outstanding as of December 31, 1926, and a book value of fixed assets amounting to $67,153.22 as of the same date. The commission found that the fair value of the property was substantially the book figure.

Commission Authorizes Extension Into Another's Territory.

The Lodi Telephone Co., Lodi, Wis., has been directed by the railroad commission to extend its lines to furnish service to the residence occupied by H. M. Warren on a farm in section 20 of the town of Arlington, Columbia county.

The farm, approximately midway between Poynette and Lodi, has been served for some 15 years by the Poynette Telephone Co. The owner now lives in Lodi, and the farm is rented to Mr. Warren who took possession in March, 1927, on a yearly rental contract. In June, 1927, Mr. Warren discontinued his subscription to the Poynette Telephone Co. The loss of a subscriber at this point means that the Poynette Telephone Co. has to maintain a line one mile in length to serve one subscriber, just across the road from the Warren residence.

Mr. Warren's relations in the past have

been largely with patrons of the Lodi Telephone Co. in the vicinity of Lodi. His business is transacted almost entirely at Lodi. His family and social relations are there. He goes to Lodi for medical, veterinarian and railroad service.

In view of the fact that the Lodi company is willing to waive objection to the restoration of service at this location by the Poynette company at any time, the commission believed that the desires and necessities of the subscriber should be given considerable weight, even though he is a tenant on the premises.

As no substantial duplication of line will result from the desired extension, the commission found that public convenience and necessity require the extension of the lines of the Lodi Telephone Co. to the residence of H. M. Warren.

Tacoma, Wash., Suburban Residents Petition for Lower Rates.

The charge that telephone rates to the Tacoma suburban communities of Dash Point, Wash., and Brown Point are "extortionate and beyond the means of the ordinary householder" is contained in a petition filed with the Washington Department of Public Works. The petition headed with the signatures of P. F. Gleason, Fred F. Altson and Clinton C. Hull, bears 54 names and demands a new hearing on the telephone arrangements for the two communities, which were previously adjusted about a year ago.

Following a hearing last year by the department of public works, the Pacific Telephone & Telegraph Co. was ordered to make several improvements, including the furnishing of 24-hour call service and the provision of an additional trunk line.

Summary of Commission Rulings and Schedules of Hearings.

INTERSTATE COMMERCE COMMISSION.

July 28: Acquisition by the Mountain States Telephone & Telegraph Co., of the properties of the Meridian Independent Telephone Co., Meridian, Ida., found to be of advantage to the persons to whom service is to be rendered and in the public interest. Certificate issued.

CALIFORNIA.

August 11: Sierra Madre Telephone & Telegraph Co., Sierra Madre, applied for authority to establish a charge of $3 for moving or changing type of telephone equipment.

ILLINOIS.

July 29: Order approved authorizing the Mendon Telephone Co. to purchase from Chas. A. Chittenden, doing business as Mendon Telephone Co., the telephone properties owned and operated in the villages of Mendon and Fowler, Adams county and vicinity, for $19,000 in cash, as set forth in the order and granting to the company a certificate of convenience and necessity to own, construct, and maintain and operate a telephone system in the villages and vicinity, and to issue and sell $25,000 aggregate par amount of its capital stock consisting of 250 shares of par value of $100 per share, as set forth in the order.

July 29: Order approved granting to the Commercial Telephone Co. a certificate of convenience and necessity to construct, maintain and operate a telephone exchange at Allendale, Wabash county and vicinity, and to transact a telephone public utility business in connection therewith in the territory heretofore served by the operation of the existing telephone property recently acquired from Allendale Telephone Association.

July 29: Order approved suspending to December 5, 1927, rates for telephone toll service in Apple River, Scales Mound, Elizabeth, Hanover, Stockton, East Dubuque and Warren, stated in rate schedule Ill. C. C. 1, of the Pitcher Telephone Co.

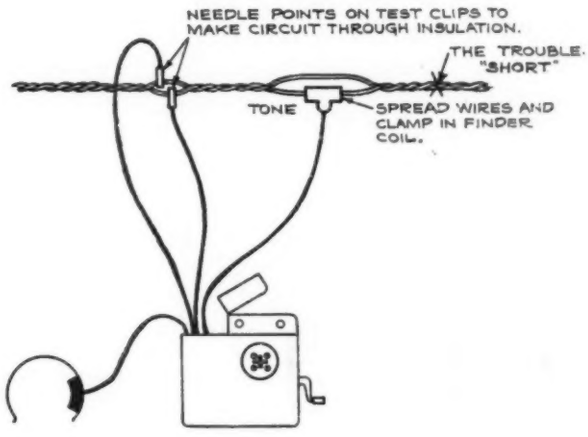
July 29: Order approved authorizing the Commercial Telephone Co. to purchase, and C. A. Galloway, doing business as Noble Telephone Co., to sell, the entire telephone property located in Noble, Richland county and vicinity, for the consideration of $4,000 in cash and granting to the Commercial Telephone Co. a certificate of convenience and necessity to own, construct and maintain a telephone system and to render a public utility business in the village of Noble, Richland county and vicinity, as set forth in the order.

July 29: Order approved suspending until December 15, 1927, proposed rates for telephone service in DeKalb, Esmond, Genoa, Hinckley, Kingston, Kirkland, Lee, Lindedwood, Malta, Maple Park, Mount Morris, Oregon, Rochelle, Shabbona, Steward, Sycamore and Waterman, stated in rate schedules Ill. C. C. 2, of the DeKalb-Ogle Telephone Co.

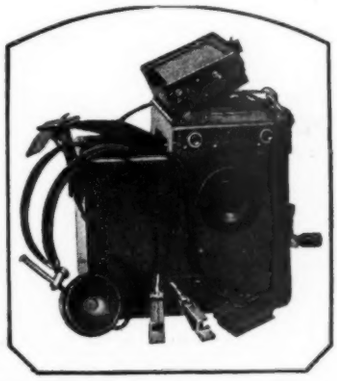
July 29: Schedules were filed with the commission, but no action taken, as follows:

Illinois Bell Telephone Co.'s rate schedule I. P. U. C. 1, revised sheet 7, applying

Method of Locating A High Joint


NEEDLE POINTS ON TEST CLIPS TO MAKE CIRCUIT THROUGH INSULATION.
THE TROUBLE. "SHORT"
TONE
SPREAD WIRES AND CLAMP IN FINDER COIL.

The West Test Set can be used with great economy in connection with the test boards of larger companies. The cost of testing high revenue earning circuits is specially great at the peak periods of the day. With the West Test Set it can be readily seen that there will be a saving with the lineman doing his own testing on the line and confining his efforts to the circuit in actual trouble, without tying up other working circuits in calling the test board man to have tests made.



Telephone Companies all over the country have adopted the West Test Set as standard equipment.

Weighs less than 10 lbs.

Send for Bulletin giving all the tests.

American Electric Company, Inc.

State and 64th Streets
Chicago, U. S. A.

Licensee and Distributor of

The West Test Set

The advertiser appreciates your mentioning TELEPHONY

to the Evergreen Park exchange, Cook county, effective August 20, 1927.

Illinois Bell Telephone Co.'s rate schedule Ill. C. C. 1, covering telephone service in Warrenville, effective September 1, 1927.

Morrison Telephone Co.'s Ill. C. C. 2, covering telephone toll service in Morrison, Whiteside county, effective October 1, 1928.

Stephenson County Telephone Co.'s rate schedule Ill. C. C. 1, sheet 10, applying to toll rates, effective October 1, 1926.

Raritan Switchboard & Telephone Co.'s rate schedule Ill. C. C. 1, covering telephone toll service applying to Raritan, Henderson county, effective August 20, 1927.

INDIANA.

August 1: Petition filed by the Union Telephone Co., Carmel, for rehearing on the rate increase granted the company July 29. The original petition for a rate increase asked for a valuation and rate of return sufficient to bring in an annual return of $10,787.04, whereas the new schedule will permit an annual return of only $7,964.04, it was alleged.

August 5: A supplemental order issued in the Lafayette Telephone Co.'s petition for authority to issue $450,000 of 5 per cent bonds. It was found that the value of the property of the company is sufficient to provide ample security for the bonds.

MINNESOTA.

August 13: Application of Red River Valley Telephone Co. for increased rates at its Climax exchange granted and rates petitioned for authorized, effective September 1.

August 13: Hewitt Telephone Co., Hewitt, authorized to increase its rates and establish service connection charges. The schedule submitted for approval was modified by commission as to the charge for rural switching and authorized effective as of September 1.

August 25: Hearing at Pine Island in the matter of the application of the Pine Island Telephone Co. for authority to change its rates at Pine Island.

August 26: Hearing at Sandstone in the matter of the application of the Northwestern Bell Telephone Co. for authority to change and increase its rates for exchange service at its Sandstone exchange.

MISSOURI.

August 6: Middle States Utilities Co. permitted to discontinue its exchange at Saline, after having made provision for the subscribers of that exchange through other exchanges of the company, and that it file with the commission its P. S. C. Mo. rate schedule for its Pleasanton, Iowa, exchange, to become effective ten days from the date of the order.

OKLAHOMA.

August 2: Southwestern Bell Telephone Co. authorized to increase rates at Cordell, effective when common battery equipment is installed.

WASHINGTON.

August 6: Petition filed by 54 residents of Dash Point and Brown Point, suburbs of Tacoma, asking a new hearing on the telephone arrangements for the two communities which were adjusted about a year ago.

WISCONSIN.

August 7: Brodhead Telephone Co. of Brodhead authorized to issue $10,000 common stock as a dividend. It had $37,500 of common stock outstanding and a book value of $67,153.

August 10: Lodi Telephone Co. directed to extend its lines to the farm occupied by H. M. Warren in section 20 of the town of Arlington, Columbia county.

More Than A Slogan:

"Always Reliable"

Covered by patents.
No. 22 furnace—9¼" shield.
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The users of this line invented this slogan for the reason that "Always Reliable" furnaces and torches are *just that*.

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OTTO BERNZ CO. INC.
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Stocks in Newark, N. J., New York City, Chicago and San Francisco.

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Condensed Telephone News

Companies Are Urgently Requested to Forward to Us Promptly News Concerning Construction, Rebuilding, Financing, Election of Officers, Sales and Purchases of Exchanges or Other Activities

Incorporations and New Telephone Companies.

DILLARD, ORE.—The South Umpqua Telephone Co. has been incorporated with a capital stock of $5,000. The incorporators are S. C. Miller, W. E. Hercher and B. L. Eddy of this city.

Miscellaneous.

DANVILLE, ILL.—Work has commenced on a two-story addition to the building of the Vermilion County Telephone Co. in this city. It is reported that the contract price of the addition is $84,000.

CICERO, IND.—The sale of the Cicero Telephone Co. to Carl Mote, of Indianapolis, formerly secretary of the Indiana Public Service Commission, was completed on August 6. Mr. Mote is president of the Associated Telephone Co., which owns a number of telephone exchanges in central and nothern Indiana.

INDIANAPOLIS, IND.—The Associated Telephone Co. has filed an amendment with the secretary of state, changing the object of the company.

WESTFIELD, IND.—The White Star Telephone Co. which has exchanges at Westfield and Jolietville with telephones through the rural communities in the western part of Hamilton county, has been sold to A. L. Thomas of Windfall. The consideration is said to have been $20,000. Wilbur Sharp, of Lebanon, will be the new manager of the latter company.

ARLINGTON, IOWA—A farmers' telephone company is being organized here. After the existing company had refused petitions from the farmers asking free toll service in a radius of 25 miles, the Fairfield Township Farm Bureau met to discuss plans and appointed a committee for the development of a farmers' line at Lakewood.

CENTERVILLE, IOWA—Purchase and consolidation of the Appanoose County Mutual Telephone Co. by the Appanoose County Telephone Co., is announced by C. A. Farrington, of the purchasing company.

WASHTA, IOWA—Paul Miller of Sioux City met recently with the city council to ask for a 25-year franchise to operate a telephone exchange in the city of Washta. The franchise was granted and will be submitted to the people at a special election August 31. If carried, Mr. Miller will

POSITIONS WANTED

POSITION WANTED — Experienced telephone manager, bookkeeper, collector, wants a position with reliable telephone company. Good Texas town preferred. Write Box 183, Lone Oak, Texas.

POSITION WANTED — Iowa man wants short time jobs, switchboard and cable work. Geo. Bishton, Box 645, Cedar Rapids, Iowa.

POSITION WANTED—Ohio man, experienced wire chief, switchboard man and installer wants permanent position. Address 6976, care of TELEPHONY.

POSITION WANTED—Middle aged man, neat, clean, strictly sober, worthy of any place of trust, with seven years' experience, as telephone operator. Can handle chief operating and keep subscriber's ledger. Employed, but wishes to make change. Address 6968, care of TELEPHONY.

POSITION WANTED—By married man 32 years old. Twelve years' experience on all around telephone work. Can come at once. Address 6970, care of TELEPHONY.

POSITION WANTED — Position as Manager of Magneto or Common Battery Exchange; will invest $10,000.00 in a good company. Address 6971, care of TELEPHONY.

WANTED TO BUY

WANTED TO BUY—A pioneer telephone engineer wants to invest some capital in an independent telephone company where his services can be used. I will buy all or part interest. What have you. Address 6975, care of TELEPHONY.

WANTED TO BUY—By practical telephone man, a telephone exchange having from 200 to 500 subscribers or interest in and management of large exchange. Address 6977, care of TELEPHONY.

OPPORTUNITIES!

Rates 8 cents per word, payable in advance. Minimum charge $1.50 for 18 words or less.

"REBUILT" TELEPHONE APPARATUS

and exchange equipment saves you 30 to 50 per cent—quality and efficiency guaranteed.

EVERYTHING YOU NEED

for the installation and operation of a complete exchange—Magneto or Central Energy.

TWENTY YEARS' SUCCESSFUL OPERATION

of our "Rebuilt" Equipment Department puts it past the experimental stage. Ask for our Free No. 78 Bargain Bulletin.

ADDRESS

"Rebuilt" Equipment Department

Premier Electric Company

Chicago, Ill.

"REBUILT" when connected with PREMIER means something.

Reconstructed Equipment

Kellogg No. 97 C. B. desk set with either No. 75 or No. 259 steel signal sets, with straight line or 16-33-50 or 66 cycle harmonic ringers @ $7 50
Western Elec. No. 22 3-bar Bdg. Gen., complete with mounting screws and crank @ 1.40
Western Elec. No. 2C Ball type combine line drops and jacks, per strip of 5 @ 7.50
Paraffine Swbd. lacing Twine, size No. 12, per pound ball @ 1.10
Stromberg No. 357 C. B. straight line steel hotel sets with Ind. Coil Booster talking ckt. @ 5.75
Kellogg No. 533 type C. B. Steel hotel sets (Retard Coil type), Straight line @ $5.75—Harmonic 16-33-50 or 66 cycle @ 6.00
Dean or Garford C. B. Steel hotel sets (Balance Coil type), Straight line @ $5.25—Harmonic 16-33-50 or 66 cycle @ 5.50
Stromberg No. 599 type 4-bar 1000-1600 or 2500 ohm Bdg. compacts @ 6.90
Stromberg No. 11 or No. 14 Booster C. B. Ind. coils @ ..... .40

Write for Our Bulletin
REBUILT ELECTRIC EQUIPMENT CO. Not Inc.
1940 W. 21st St., Chicago

HELP WANTED

WANTED—Young man with experience in Telephone Revenue Accounting, Plant Accounting and General Accounting. In reply state age, experience in the telephone business, by whom at present employed, present salary and education. Replies will be considered strictly confidential. Address 6954, care of TELEPHONY.

WANTED—Man to do exclusive overhaul work, three to four months on switchboards, lines and cable. Permanent place depending on results shown. Address 6965, care of TELEPHONY.

HELP WANTED—Man and wife experienced for small exchange of three hundred telephones. Wife should be capable of operating and the man suitable to do line work and local manager duties. Address 6974, care of TELEPHONY.

ATTENTION

CENTRAL ENERGY EQUIPMENT
Common Battery

KELLOGG No. 39 desk stands only, complete with new cords $4.00
KELLOGG No. 97 desk stands only, complete with new cords 5.00
KELLOGG No. 39 desk sets, with No. 75 signal boxes (steel) 6.00
KELLOGG No. 39 desk stand, No. 259 steel signal box, harmonic ringer .. 6.50
KELLOGG No. 97 desk sets, with No. 75 steel signal box 7.25
KELLOGG No. 97 desk stand, No. 259 steel signal box, harmonic ringer .. 7.50
KELLOGG steel hotel set, old type, straight line ringer, retarded coil type 6.00
KELLOGG steel hotel sets, straight line or harmonic ringers, retarded coil type 6.50
KELLOGG steel hotel sets, straight line or harmonic ringer, induction coil type 7.00
KELLOGG No. 39 desk stand, with No. 408 wood signal box (late type), straight line ringer 6.00
Harmonic ringer 6.25
KELLOGG No. 97 desk stand, with No. 408 wood signal box (late type), straight line ringer 7.00
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FOR SALE—HALF PRICE—Lally Light Plant, 32 volt. Willard Storage Batteries, 7 plate. Holtzer-Cabot Dynamotor Ringing Machine, runs on 32 and gives off 80 volts and up. With volt meter, ammeters, hydrometer, thermometer, jars, jugs and funnels. Wiring, cleats, cordage, switches and bulbs to light office, shop and residence rooms. Practically brand new and in A1 shape. Reason High Line, F. O. B. $200.00. Home Telephone Co., Gentry, Arkansas.

FOR SALE—Two-position Dean Mahogany Toll Switchboard; one position fully equipped; 12 cord circuits; 30 combined drops and jacks; 10 recording trunks, lamp signals; 10 service jacks and 40 transfers to local switchboard. Address The Columbia Telephone Company, Columbia, Pa.

FOR SALE—300 Compact Magneto telephones suitable for city use. Equipped for straight line, code or biased ringing, $3.00 each. Creston Telephone Co., Creston, Iowa.

purchase the local plant from the Farmers' & Merchants' Telephone Co.

NEW BALTIMORE, MICH.—Agreement has been reached for the transfer of the Anchor Bay Telephone Co. rights and equipment to the Michigan Bell Telephone Co. The sanction of the state utilities commission and the Interstate Commerce Commission must be secured before the plans can be consumated.

The Anchor Bay Telephone Co., of which Floyd Andrews of New Baltimore holds practically all of the stock was organized a score of years ago and pioneered in the local telephone field. The company now serves something more than 350 homes.

CLARISSA, MINN.—A new building is being constructed by Eagle Valley Cooperative Telephone Association on West William street.

HOUSTONIA, MO.—With the purchase of the Houstonia Telephone Co. from F. A. Squires, the Central Missouri Telephone Co. increases the number of exchanges in its system to 74.

Two months ago the Sweet Springs Telephone Co., of which Willis Smith was the principal owner, was bought by the Central Missouri Telephone Co., which manages the affairs of the southern part of its system from offices in Warrensburg.

WARWICK, N. Y.—The Warwick Valley Telephone Co. has signed contracts to acquire the plant and equipment of the Florida Telephone Co. and also the building in which the exchange is located in the village of Florida. The Warwick company will issue 1,250 shares of common stock to finance the purchase and also expects to issue 3,357 shares to make more capital available.

BOWMAN N. D.—Farmers residing south of here have organized a telephone company and will build a line to connect with Buffalo while giving service to a number of ranches between the two towns.

STEELE, N. D.—A new rural telephone line, owned by Charles Olson, has been instituted in the territory to the south of Tappen. The line, which connects with the Tappen exchange, was built as a private proposition by Mr. Olson but has been opened to others now if they will agree to buy all necessary equipment and keep the lines in shape.

BELLEVUE, OHIO—Frank A. Knapp, of Bellevue, and his associates have added the Haskins Telephone Co. and the Tontogany Telephone Co. to their holdings, Jay Philips selling to them.

KENTON, OKLA.—Kenton Telephone Co. owned and operated for the last 15 years by H. H. Hughes of Kenton, has been leased to O. T. Eddy, formerly of this city but for the last several years a resident of Oklahoma City, and Rock Springs, Wyo.

WOOSTER, OHIO—The Ohio Central Telephone Co. has purchased the assets of the Wayne County Telephone Co., it has been announced.

Stockholders of the company voted to accept the Ohio Central's offer of $82,000 for their property. The Wayne County company was organized a score of years ago and is known as "The Farmers' Line."

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